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# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. Pre-mobilization Submittals will be paid in accordance with lump sum price established for all Preconstruction Meetings, final design, planning, health and safety, and other Submittals in accordance with the Contract or required and accepted by the Departmental Representative as in accordance with the Contract prior to mobilization to Site.

1.1.2. Mobilization will be paid in accordance with lump sum price established for mobilizing all necessary equipment, materials, supplies, facilities, and personnel associated with the Works to the Site. Includes initial insurance, bonding, and permits. Additional insurance, bonding, and permits due to changes in scope, cost, and schedule as accepted by the Departmental Representative will be included in Contract amendments.

1.1.3. Site Preparation will be paid in accordance with lump sum price established to prepare the Site for planned construction works. Includes clearing and grubbing, temporary removal of existing infrastructure, utility location, rerouting, and protection, and construction of temporary onsite access roads. Also includes removal of any incidental or generated material. Also includes Preconstruction Precondition Survey and Preconstruction As-Built Documents.

1.1.4. Site Facilities Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure in accordance with the Contract. Includes temporary structures and facilities, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utilities.

1.1.5. Site Facilities Operation will be paid in accordance with unit rate price established for time to operate and maintain all infrastructure between mobilization and demobilization. Measurement as recorded time by Departmental Representative. Includes temporary structures and facilities, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utilities. Also includes ongoing services including project management, security, surveying, noise monitoring, vibration monitoring, utilities, project meetings, inspections, progress Submittals, traffic control, health and safety, Environmental Protection cleaning, and operation during inclement weather. Also, includes living out allowances, travel and room and board. Rate must not vary even if hours of work and/or days of work vary. Time will only be paid for duration in accordance with the Contract and changes in schedule as accepted by the Departmental Representative and included in Extension of Time on Contracts.

1.1.6. Standby Time will be paid in accordance with unit rate price established, for time when construction Work is unable to proceed, and that is directly

attributable to any neglect or delay that occurs after the date of the Contract on the part of the Departmental Representative in providing any information or in doing any act that the Contract expressly requires the Departmental Representative. Measurement as recorded time by Departmental Representative. Includes machinery and labour standby costs. Does not include items covered by Site Facilities Operation. Standby Time may be pro-rated based on hours of work. Make all efforts to minimize impacts due to delays caused by the Departmental Representative, including re-sequencing Work. Provide documentation of a sufficient description of the facts and circumstances of the occurrence to enable the Departmental Representative to determine whether or not the Standby Time is justified. Reviews, sampling, or other work conducted by the Departmental Representative with time allowances in accordance with the Contract will result in no increase to the Contract Amount nor Extension of Time for completion of the Work.

1.1.7. Fill and grade for drainage cutting and filling will be paid in accordance with unit rate price established for volume of material imported supplied, placed, compacted and graded for drainage. Measurement as recorded insitu volume of final Material Extents as surveyed by Departmental Representative. Includes handling, transport, and stockpiling onsite. Does not include material excavated as part of Temporary works including Sloping and Shoring.

1.1.8. Purchase, Transport and Placement of Approved Subbase Material will be paid in accordance with unit rate price established for volume of material imported supplied, placed, compacted and graded for drainage. Measurement as recorded insitu volume of final Material Extents as surveyed by Departmental Representative. Includes handling, transport, and stockpiling onsite.

1.1.9. Waste Oversize Debris Removal will be paid in accordance with unit rate price established for time to remove oversize material from excavation area and liner footprint area. Measurement as recorded time by Departmental Representative. includes include Loading, Transport and approved Disposal of debris.

1.1.10. Fill-Import will be paid in accordance with unit rate price established per weight for pre-approved imported Backfill. Measurement as recorded on backfill source weigh scale certified by Measurement Canada receipts and results provided to Departmental Representative. Includes analytical testing and inspections to demonstrate compliance with Contract, provision, loading, hauling to Site, onsite transport, placing, grading and compacting. Does not include material backfilled as part of Temporary Sloping and Shoring.

1.1.11. Purchase, Transport and Placement of Approved Liner includes transportation to the site, storage handling, repairs to any pre-existing damage, shop welding, field welding, counter weighting of liner during placement and supply of appropriate equipment to place liner and capping sand material without damaging the liner.

1.1.12. Re-vegetate construction area and Ditches supply hydroseed, straw mats or other material approved by the Departmental Representative to be placed for the purpose of facilitating revegetation.

1.1.13. Exploratory Digging/Test Pitting supply test pitting equipment and cover time for all equipment and personnel while Departmental Representative is conducting exploratory test pitting.

1.1.14. Non-Contaminated Material and Waste Transport will be paid in accordance with unit rate price established for weight of material removed. Measurement as recorded on Landfill weigh scale certified by Measurement Canada and results provided to Departmental Representative. Includes handling, stockpiling, loading, unloading, hauling, and interim storage for material transported from Site. Does not include material excavated as part of Temporary Sloping and Shoring and required to be disposed offsite due to unsuitability.

1.1.15. Site Restoration will be paid in accordance with the lump sum price established to restore the Site to make suitable for post-Work use according to Drawings. Includes re-establishment of pre-existing infrastructure, final grading, topsoil reuse, revegetation, and deconstructing and removal from Site all temporary facilities and removal of any incidental or generated material. Also includes repair and maintenance of access road, restoration of equipment staging areas, access pad areas, as required.

1.1.16. Demobilization will be paid in accordance with lump sum price established for demobilizing all equipment and personnel associated with the Works from the Site. Includes decontaminating all equipment prior to removal from Site.

1.1.17. Closeout Submittals will be paid in accordance with lump sum price established for Final Site Inspection (for Certificate of Completion purposes), Closeout Meetings, provision of final as-built documents and completion documents as directed by the Departmental Representative.

1.1.18. OPTIONAL Backfill-Owner Supplied will be paid in accordance with unit rate price established per weight for pre-approved imported Backfill. Measurement as recorded on backfill source weigh scale certified by Measurement Canada receipts and results provided to Departmental Representative. Includes analytical testing and inspections to demonstrate compliance with Contract, provision, loading, hauling to Site, onsite transport, placing, grading and compacting. Does not include material backfilled as part of Temporary Sloping and Shoring.

## 1.2. Definitions

1.2.1. Certificate of Completion: see General Conditions.

1.2.2. Change Order: PWGSC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.

1.2.3. Confirmation Samples: soil and sediment samples collected from the base and walls of the excavation by the Departmental Representative to confirm that the remedial objectives for the Work have been met.

1.2.4. Contaminated Material: soil, sediment, and other solid material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) exceed the levels specified in policies and regulations.

Includes Hazardous Waste and Waste Quality. Does not include Non-Contaminated Material or Waste. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:

1.2.4.1. For all sites: Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines and CCME Canada-Wide Standards.

1.2.4.2. For sites in BC, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): BC Hazardous Waste Regulation, BC Approved Water Quality Guidelines, BC Contaminated Sites Regulation.

1.2.4.3. For sites in Yukon, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): Yukon Special Waste Regulation, Yukon Contaminated Sites Regulation.

1.2.5. Contaminated Material Extents: lateral and vertical extents of Contaminated Material to be remediated to meet remediation objectives. Extents on Drawings are approximate and may vary based on field observations or Confirmation Samples. Does not include Topsoil, Overburden, or material excavated as part of Temporary Sloping and Shoring.

1.2.6. Contaminated Water: liquid material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) meet or exceed the levels specified in policies and regulations. Includes Hazardous Waste and water that is not suitable for aquatic life, irrigation, livestock or drinking water or any other water use specified in the BC Contaminated Sites Regulation or Yukon Contaminated Sites Regulation, as applicable. Does not include Non-Contaminated Water or Sewage Wastewater. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:

1.2.6.1. For all sites: Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines and CCME Canada-Wide Standards.

1.2.6.2. For sites in BC, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): BC Hazardous Waste Regulation, BC Contaminated Sites Regulation.

1.2.6.3. For sites in Yukon, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): Yukon Special Waste Regulation, Yukon Contaminated Sites Regulation.

1.2.7. Contaminated Water Treatment Plant: a temporary onsite or existing offsite facility located in Canada that is designed, constructed and operated for the handling or processing of Contaminated Water in such a manner as to change the physical, chemical or biological character or composition of the water to lower than the site-specific remedial objective, Discharge Approval, and in compliance with all regulations.

1.2.8. Contemplated Change Notice: PWGSC form issued by the Departmental Representative to the Contractor requesting Contractor to provide a quote, which may result in a Change Order.
1.2.9. Contract: see General Conditions.
1.2.10. Contract Amount: see General Conditions.
1.2.11. Contractor: see General Conditions.
1.2.12. Departmental Representative: see General Conditions.
1.2.13. Discharge Approval: permit, certificate, approval, license, or other required form of authorization issued by appropriate federal agency, province, territory, or municipality having jurisdiction and authorizing discharge.
1.2.14. Disposal Facility: a facility specifically used to introduce waste into the environment for the purpose of final burial.
1.2.15. Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
1.2.16. Environmental Protection: prevention, control, mitigation, and restoration of pollution and habitat or environmental disruption during construction. Control of Environmental Pollution and Damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; vibrations; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
1.2.17. Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including: personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.
1.2.18. Extension of Time: see General Conditions.
1.2.19. Extension of Time on Contracts: PWGSC form requesting an Extension of Time.
1.2.20. Final Completion: see General Conditions.
1.2.21. Hazardous Waste: Contaminated Material which meets the regulatory definition of Hazardous Waste.
1.2.22. Land Treatment Facility: equivalent of Soil Treatment Facility.
1.2.23. Landfill Facility: an existing offsite facility located in Canada that is designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.
1.2.24. Materials Source Separation Program: consists of a series of ongoing activities to separate reusable and recyclable waste into categories from other types of waste at point of generation.

1.2.25. Non-Contaminated Material: soil, sediment, and other solid material excavated incidentally which meets:

1.2.25.1. For Sites in BC: the BC Contaminated Sites Regulation Schedule 7 Column IV.

1.2.25.2. For sites in Yukon: the Yukon Contaminated Sites Regulation most stringent of Schedule 1 and 2.

1.2.26. Non-Contaminated Water: liquids which are suitable for direct discharge to the environment after removal of sediment, and which is not Contaminated Water or Sewage Wastewater. Includes surface runoff, stormwater, and groundwater which has not come into contact with Contaminated Material.

1.2.27. On Site Instruction: notices, instructions, or directions issued by the Departmental Representative to the Contractor.

1.2.28. On Site Notice: notice or other communication issued by the Contractor to the Departmental Representative.

1.2.29. Overburden: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is suitable as Backfill. Does not include Topsoil or material excavated as part of Temporary Sloping and Shoring.

1.2.30. Progress Payment: see General Conditions.

1.2.31. PWGSC: Public Works and Government Services Canada. Representative of Canada with control of the Site.

1.2.32. Qualified Professional: a person working for the Contractor who is registered in relevant jurisdiction with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Includes Geotechnical Engineers, Environmental Consultants, and Land Surveyors.

1.2.33. Quote: Contractor's cost estimate issued to the Departmental Representative as per the relevant Contemplated Change Notice via an On Site Notice.

1.2.34. Remediation by Excavation: complete excavation of Contaminated Material and incidental Non-Contaminated Material to the Site boundaries for the purpose of remediating the Site to meet numerical standards. Includes full treatment and disposal. Does not include risk assessment or risk management of material onsite. Does not include encapsulation or solidification in place.

1.2.35. Sewage Wastewater: liquid waste which is not suitable for direct discharge to the environment, and which must be either treated offsite or discharged to a sanitary sewer. Includes water from hand basin, shower, personal hygiene facilities, or other liquid waste from sanitary facilities.

1.2.36. Site: work area available to Contractor according to Drawings. Does not include shared or public areas, including common roads.

1.2.37. Special Waste: Yukon equivalent of Hazardous Waste.

1.2.38. Subcontractor: see General Conditions.

1.2.39. Submit/Submittals: documents from the Contractor to the Departmental Representative as: required by Contract; stipulated in permit, certificate,

approval, license, or any other form of authorization; by convention or industry practice. Submittals are final only after review and accepted in writing by Departmental Representative.

1.2.40. Substantial Performance: see General Conditions.

1.2.41. Superintendent: see General Conditions

1.2.42. Supplier: see General Conditions.

1.2.43. Topsoil: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is a surface organic layer to facilitate vegetation growth. Does not include Overburden or material excavated as part of Temporary Sloping and Shoring.

1.2.44. Transfer/Interim Storage Facility: a facility specifically used to transfer or short term storage Contaminated Material during offsite transport.

1.2.45. Treatment Facility: a facility specifically used to treat Contaminated Material. May be Owner's (PWGSC provided) or Offsite (Contractor provided). Owner's Soil Treatment Facility is located on property under PWGSC control, but may be located at a different location than where construction work occurs. Offsite Treatment Facility may treat soil, sediment, or water.

1.2.46. Waste: Non-Contaminated Material that is not soil. Includes cleared and grubbed vegetation, litter, rubbish, debris, cobbles, boulders, excess construction material, lumber, steel, plastic, concrete, and asphalt. Includes Topsoil and Overburden that is not re-used.

1.2.47. Waste Oversize Debris: Waste that is required to be excavated and is: larger than 1 cubic metre or larger than 2 metres in one dimension, cannot be removed with a typical excavator with bucket, and requires the use of special equipment (e.g., saws, hydraulic cutters, excavator hammers, vibratory pile extractors). Includes bedrock, boulders, pilings, pipes, building structures, and concrete foundations.

1.2.48. Waste Quality: soil or other material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands or any other land use specified in the BC Contaminated Sites Regulation or Yukon Contaminated Sites Regulation, as applicable.

1.2.49. Waste Reduction Plan: a written report which addresses opportunities for reduction, reuse or recycling of materials.

1.2.50. Work: see General Conditions.

1.2.51. Working Day: see General Conditions.

### 1.3. Action and Informational Submittals

1.3.1. After hours work: at least 5 Working Days prior to commencing after hours work Submit a schedule showing requested dates, times, and reasons for after hours work. Approval will only be granted for reasons valid in the opinion of the Departmental Representative and if request can be reasonably accommodated by other contracts.

### 1.4. Work Covered by Contract

1.4.1. Work to be performed under the Contract includes, but is not limited to, the following items, including all ancillary Work, covered further in the Contract:

1.4.1.1. Pre-mobilization Submittals
1.4.1.2. Mobilization
1.4.1.3. Site Preparation
1.4.1.4. Site Facilities Provision
1.4.1.5. Site Facilities Operation
1.4.1.6. Standby Time
1.4.1.7. Fill and grade for drainage
1.4.1.8. Purchase, Transport and Placement of Approved Subbase Material
1.4.1.9. Waste Oversize Debris Removal
1.4.1.10. Fill-Import
1.4.1.11. Purchase, Transport and Placement of Approved Liner
1.4.1.12. Re-vegetate construction area and Ditches supply hydroseed, straw matts or other material approved by the Departmental Representative
1.4.1.13. Exploratory Digging/Test Pitting
1.4.1.14. Non-Contaminated Material and Waste Transport
1.4.1.15. Site Restoration
1.4.1.16. Demobilization
1.4.1.17. Closeout Submittals
1.4.1.18. OPTIONAL Backfill-Owner Supplied

1.4.2. Green Requirements:

1.4.2.1. Use only environmentally responsible green materials/products with no Volatile Organic Compounds (VOC) emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality – subject of acceptance of Submittal of Materials Safety Data Sheet (MSDS) Product Data.
1.4.2.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.
1.4.2.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from Landfill Facility.

1.4.3. Work not included in the Contract comprises such work and services specifically listed as:

1.4.3.1. Not Used.

## 1.5. Location

1.5.1. The Site location is shown on Drawings.
1.5.2. There is no civic street address or PIN for the Site.

## 1.6. Project/Site Conditions

1.6.1. Work at Site will involve contact with contaminated materials, requiring appropriate health and safety and environmental protection procedures.
1.6.2. Complete list of anticipated contaminants and concentration levels on the Site available separately in assessment reports and/or Drawings.
1.6.3. Existing condition on the Site identified according to Drawings.
1.6.4. Utilities/services availability on Site:
1.6.4.1. Electrical power is not available on Site.
1.6.4.2. Water is not available on Site.
1.6.4.3. Sanitary sewer is not available on Site.
1.6.4.4. Storm sewer is not available on Site.

## 1.7. Other Contracts

1.7.1. Other contracts are currently in progress at Site.
1.7.2. Other contracts are:
1.7.2.1. Environmental and other consultants.
1.7.2.2. Site users as identified in Contract Documents.
1.7.3. Further contracts may be awarded while the Contract is in progress.
1.7.4. Cooperate with other contractors in carrying out their respective works and carry out directions from Departmental Representative.
1.7.5. Coordinate Work with that of other contractors. If any part of Work under the Contract depends for its proper execution or result upon Work of another contractor, report promptly to Departmental Representative, in writing, any defects which can interfere with proper execution of this Work.

## 1.8. Products Supplied by the Departmental Representative

1.8.1. Not Used.

## 1.9. Contractor's Use of Site

1.9.1. Use of Site:
1.9.1.1. For the sole benefit of Canada.
1.9.1.2. Exclusive and only for completion of the execution of Work.
1.9.1.3. Assume responsibility for assigned premises for performance of this Work.
1.9.1.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
1.9.2. There are no pre-existing arrangements for encroachment on the neighbouring properties. Shoring designs accommodating no offsite encroachment, or arrangements for offsite encroachment, are the responsibility of the Contractor.
1.9.3. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
1.9.4. Do not unreasonably encumber Site with material or equipment.
1.9.5. Accommodate common areas with other Site users, including roadways.
1.9.6. Segregate Contractor's work area from common areas to prevent unintentional multiple employer worksite, as required.

### 1.10. Existing Permits

1.10.1.1. Existing permits are attached in Appendix D.

### 1.11. Schedule Requirements

1.11.1. Work to be initiated: within 5 Working Days of Contract Award.
1.11.2. Pre-Mobilization Submittals: within 10 Working Days of Contract Award.
1.11.3. Mobilization: within 10 Working Days of Contract Award.
1.11.4. Site Works: Final Completion no later than January 15, 2017.
1.11.5. Completion of the Work: no later than February 15, 2017. Includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

### 1.12. Hours of Work

1.12.1. Restrictive as follows:
1.12.1.1. Working Day work hours are 07:00 to 19:00.
1.12.2. Obtain consent from Departmental Representative for all after hours Work, including weekends and holidays.
1.12.2.1. Proceed only as directed by the Departmental Representative.

### 1.13. Security Clearances

1.13.1. Not Used.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Utility Locations: at least 5 Working Days prior to commencing any subsurface disturbance, Submit drawings identifying all utilities on the Site. Update drawings as directed by the Departmental Representative.

1.3.2. Breakdown of Lump Sum Prices: at least 5 Working Days prior to submitting the first Progress Payment, Submit a breakdown of the Contract lump sum prices including labour, material and time, in detail as directed by the Departmental Representative and aggregating Contract Amount.

1.3.3. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work. Include:

1.3.3.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.

1.3.3.2. Description of Work performed.

1.3.3.3. Current Site conditions.

1.3.3.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.

1.3.3.5. Signature of Superintendent.

1.3.4. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:

1.3.4.1. Calculation of planned cost versus actual cost and schedule forecasting and cash flow projections on a monthly basis, indicating anticipated value of future Progress Payments, for each Description of Work identified in the Unit Price Table.

1.3.4.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.

1.3.5. Coordination Meeting Minutes and Drawings: at least 5 Working Days prior to relevant Work commencing, Submit final meeting minutes and drawings from coordination with Subcontractors.

1.3.6. Quality Management Plan: within 10 Working Days after Contract award, Submit a quality management plan. Include:

1.3.6.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.

1.3.6.2. Subcontractors responsible for review, inspection and testing.

1.3.6.3. Schedule of submittals of review, inspection and testing results.

1.3.7. Review, Inspection, and Testing Results: within 5 Working Days of receipt, Submit all results of reviews, inspection, and testing performed as part of the Work, including laboratory reports and sampling chains of custody.

### 1.4. Division of Specifications

1.4.1. This specification is subdivided into Divisions and Sections in accordance with the six digit National Master Specifications System.

1.4.2. A Division or Section may consist of the Work of more than one Subcontractor. Responsibility for determining which Subcontractor provides the labour, material, equipment and services required to complete the Work rests solely with the Contractor.

### 1.5. Documents Required

1.5.1. Maintain 1 copy each of the following posted at the job Site:

1.5.1.1. General Conditions.
1.5.1.2. Drawings.
1.5.1.3. Specifications.
1.5.1.4. Addenda or other modifications to Contract.
1.5.1.5. Change orders.
1.5.1.6. Copy of current Work schedule.
1.5.1.7. Reviewed and final Shop Drawings Submittals.
1.5.1.8. One set of record Shop Drawings and Specifications for “as-built” purposes.
1.5.1.9. Field and laboratory test reports.
1.5.1.10. Reviewed and accepted Submittals.
1.5.1.11. Manufacturers’ installation and application instructions (as appropriate).
1.5.1.12. National Building Code of Canada (as appropriate).
1.5.1.13. Current construction standards of workmanship listed in technical Sections (as appropriate).
1.5.1.14. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
1.5.1.15. Environmental Protection Plan.
1.5.1.16. Quality Management Plan.
1.5.1.17. Final Meeting Minutes, Agendas and associated attachments.
1.5.1.18. Permits and other approvals.

### 1.6. Setting out of Work

1.6.1. Assume full responsibility for and execute complete layout of Work to locations, lines and elevations according to Drawings.

1.6.2. Provide devices needed to layout and construct Work.

1.6.3. Supply such services and devices in accordance with the Contract to facilitate Departmental Representative’s inspection of Work.

### 1.7. Acceptance of Substrates

1.7.1. Each trade must examine surfaces prepared by others and job conditions which can affect his work, and must report defects to the Departmental Representative. Commencement of Work will imply acceptance of prepared Work or substrate surfaces.

## 1.8. Works Coordination

1.8.1. Coordinate Work of Subcontractors.

1.8.1.1. Designate one person to be responsible for review of Contract and Shop Drawings and managing coordination of Work.

1.8.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.

1.8.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract, to assist them in planning and carrying out their respective work.

1.8.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.

1.8.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.

1.8.2.4. Publish minutes of each meeting.

1.8.2.5. Submit a copy of coordination drawings and meeting minutes as directed by the Departmental Representative.

1.8.3. Submit Shop Drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

1.8.4. Work coordination:

1.8.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

1.8.4.2. Ensure that each trade provides all other trades reasonable opportunity for Final Completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed Work.

1.8.4.3. Ensure disputes between Subcontractors are resolved.

1.8.5. Failure to coordinate Work is responsibility of Contractor.

## 1.9. Approvals of Shop Drawings, Product Data and Samples

1.9.1. Submit as directed by the Departmental Representative the requested Shop Drawings, product data, MSDS sheets and samples in accordance with the Contract.

1.9.2. Allow sufficient time for the following:

1.9.2.1. Review of product data.

1.9.2.2. Acceptance of Shop Drawings.

1.9.2.3. Review of re-submission.

1.9.2.4. Ordering of accepted material and/or products.

## 1.10. Relics and Antiquities

1.10.1. See General Conditions.

## 1.11. Additional Drawings

1.11.1. The Departmental Representative may furnish additional Drawings for clarification. These additional Drawings have the same meaning and intent as if they were included with Drawings referred to in the Contract.

1.11.2. Upon request, Departmental Representative may furnish up to a maximum of 2 sets of Drawings for use by the Contractor at no additional cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

## 1.12. Record Keeping

1.12.1. On Site Instruction: Contractual correspondence from the Departmental Representative to the Contractor. Does not include Contemplated Change Notices, Change Orders, and Extension of Time on Contracts. Sequentially numbered On Site Instructions. Include cross references to applicable On Site Notifications. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Instructions.

1.12.2. On Site Notifications: Contractual correspondence from Contractor to the Departmental Representative. Includes Submittals. Does not include Quotes, and Extension Of Time On Contracts. Must be as a sequentially numbered On Site Notifications. Include cross references to applicable On Site Instructions. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Notifications.

1.12.3. Maintain adequate records to support information provided to Departmental Representative.

1.12.4. Maintain asbestos waste shipment records or other Hazardous Waste Manifests for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.

1.12.5. Maintain bills of ladings for minimum of 300 Working Days from date of shipment or longer period required by applicable law or regulation.

## 1.13. Change Documents

1.13.1. Change Documents do not relieve Contractor of any obligation.

1.13.2. Change Documents do not change the Contractor's responsibility for sequencing, methods and means.

1.13.3. Change Documents do not change by any reason the status of the Contractor, including the function of Prime Contractor or as supervisor.

1.13.4. Change Documents include:

1.13.4.1. Change Order: There may be a change to the Contract Amount by reason of any Change Order. No Extension of Time for completion of the Work by reason of any Change Order.

1.13.4.2. Contemplated Change Notice: No increase to the Contract Amount by reason of any Contemplated Change Notice. No Extension of Time for completion of the Work by reason of any Contemplated Change Notice.

1.13.4.3. Extension of Time on Contracts: No increase to the Contract Amount by reason of any Extension of Time on Contracts. There may be an Extension of Time for completion of the Work by reason of an Extension of Time on Contracts.

1.13.4.4. Quote: No increase to the Contract Amount by reason of any Quote. No Extension of Time for completion of the Work by reason of any Quote. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any Quote.

### 1.14. System of Measurement

1.14.1. The metric system of measurement (SI) will be employed on the Contract.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Preconstruction Meeting Minutes: within 2 Working Days of the Preconstruction Meeting, Submit meeting minutes.

1.3.2. Progress Meeting Minutes: within 2 Working Days of a Progress Meeting, Submit meeting minutes. Submit revised minutes within 2 Working Days of receiving comments by Departmental Representative.

1.3.3. Information for Progress Meetings: at least 2 Working Days prior to scheduled Progress Meetings, Submit all information in accordance with the Contract for Progress Meetings. Include:

1.3.3.1. Agenda for the proposed Progress Meeting.

1.3.3.2. Updated Project Schedule.

1.3.3.3. Copies of transport manifests and disposal receipts for all materials removed from Site.

1.3.3.4. Other information as directed by the Departmental Representative or relevant to agenda for upcoming progress meeting.

1.3.4. Final Site Inspection: within 2 Working Days of the Final Site Inspection, Submit meeting minutes.

1.3.5. Closeout Meetings: within 2 Working Days of the Closeout Meeting, Submit meeting minutes.

## 1.4. Administrative

1.4.1. Schedule and administer project meetings throughout the progress of the Work weekly and at the call of the Departmental Representative.

1.4.2. Prepare agenda for meetings.

1.4.3. Submit written notice with agenda of each meeting 2 Working Days in advance of meeting date as directed by the Departmental Representative.

1.4.4. Provide physical space and make arrangements for meetings, or arrange for teleconference meetings, as directed by Departmental Representative.

1.4.5. Preside at meetings.

1.4.6. Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

1.4.7. Maintain records of meeting minutes for a minimum of 2 years after Work is completed.

1.4.8. Representative of Contractor, Subcontractor(s) and Supplier(s) attending meetings must be qualified and authorized to act on behalf of party each represents.

**1.5. Preconstruction Meeting**

1.5.1. Within 5 Working Days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
1.5.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.5.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
1.5.4. Agenda to include:
1.5.4.1. Appointment of official representative of participants in the Work, including Contractor's Superintendent and Departmental Representative.
1.5.4.2. Schedule of Work.
1.5.4.3. Schedule of Submittals.
1.5.4.4. Requirements for temporary facilities.
1.5.4.5. Site security.
1.5.4.6. Change orders, procedures, approvals required, administrative requirements.
1.5.4.7. Monthly Progress Payments, administrative procedures, hold backs.
1.5.4.8. Appointment of inspection and testing agencies or firms.
1.5.4.9. List of Subcontractor(s).

**1.6. Progress Meetings**

1.6.1. During course of Work schedule progress meetings weekly subject to approval by Departmental Representative.
1.6.2. Contractor, Superintendent, major Subcontractor(s) involved in Work, and Departmental Representative are to be in attendance.
1.6.3. Agenda to include:
1.6.3.1. Review and acceptance of minutes of previous meeting.
1.6.3.2. Review health and safety, including incidents, near misses, and corrective measures.
1.6.3.3. Review Environmental Protection, including incidents, near misses, and corrective measures.
1.6.3.4. Review contractual compliance.
1.6.3.5. Review regulatory compliance.
1.6.3.6. Review communications, problems or concerns with community.
1.6.3.7. Review of Work progress since previous meeting.
1.6.3.8. Field observations, problems, conflicts.
1.6.3.9. Updated progress schedule detailing activities planned over next 2 week period. Include review of progress with respect to previously established dates for starting and stopping various stages of Work.
1.6.3.10. Problems which impede construction schedule.

1.6.3.11. Corrective measures and procedures to regain projected schedule.
1.6.3.12. Revision to construction schedule.
1.6.3.13. Progress schedule, during succeeding Work period.
1.6.3.14. Review submittal schedules: expedite as required.
1.6.3.15. Maintenance of quality standards.
1.6.3.16. Quantities of material transported, treated, and disposed.
1.6.3.17. Review proposed changes for effect on construction schedule and on Final Completion date.
1.6.3.18. Other business.
1.6.4. Submit draft Progress Meeting Minutes for review and comment by Departmental Representative. Incorporate comments into final Progress Meeting Minutes.

## 1.7. Toolbox Meetings

1.7.1. During the course of the Work, schedule daily toolbox meetings at the start of each Work shift. Multiple meetings are required if the Contractor works multiple shifts within a 24-hour period.
1.7.2. All on Site workers to attend, including Contractor, Superintendent, major Subcontractor(s), and environmental consultants. Departmental Representative may attend.
1.7.3. Agenda to include:
1.7.3.1. Planned Work activities and environmental considerations for that shift.
1.7.3.2. Coordination activities required between Contractor, Subcontractor(s), Departmental Representative, and other contractor(s) including environmental consultant.
1.7.3.3. Health and Safety items.
1.7.3.4. Environmental Protection items.

## 1.8. Final Site Inspection

1.8.1. Within 5 Working Days of completion of Site Works but prior to Demobilization, request a meeting on Site to review the Site.
1.8.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.8.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
1.8.4. Agenda to include:
1.8.4.1. Inspect removal of all temporary equipment, materials, supplies, and facilities.
1.8.4.2. Inspect final surface grades.
1.8.4.3. Inspect final vegetation.
1.8.4.4. Inspect permanent facilities for performance and damage.
1.8.4.5. Document all damage, deficiencies, missing items, and non-conformance.

1.8.5. If required, and in the opinion of the Departmental Representative, perform another Final Site Inspection after resolving all documented damage, deficiencies, missing items, and non-conformance.

### 1.9. Closeout Meeting

1.9.1. Within 10 Working Days of completion of the Work, request a meeting to review the project.

1.9.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.

1.9.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.

1.9.4. Agenda to include:

1.9.4.1. Review Certificate of Completion.

1.9.4.2. Review final payment.

1.9.4.3. Identify lessons learned.

1.9.4.4. Perform Contractor Performance Evaluation Report Form.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Master Plan: within 10 Working Days after Contract award, Submit a Master Plan (baseline schedule).

1.3.2. Schedule of Interruption of Services: at least 5 Working Days prior to any shutdown or closure of active utilities or facilities Submit a schedule identifying type of service and dates of shutdown or closure.

1.3.3. Project Schedule and Updates: with Progress Payment, Submit a Project Schedule updated as appropriate. Progress Payment submission is incomplete without an updated Project Schedule acceptable to Departmental Representative.

## 1.4. Requirements

1.4.1. Ensure Master Plan and detail Project Schedules are practical and remain within specified Contract duration.

1.4.2. Plan to complete Work in accordance with prescribed milestones and time frame.

1.4.3. Limit activity durations to maximum of approximately 10 Working Days, to allow for progress reporting.

1.4.4. Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4.5. Include Work sequencing description and schedule:

1.4.5.1. Work Sequencing description must describe sequence, methods and means to perform each major task.

1.4.5.2. Work Sequencing schedule must show on a Gantt chart, start, end and dependencies of each major task and also indicates Work to be performed in sequence and in parallel.

1.4.5.3. Major tasks includes all items identified on Unit Price Table.

## 1.5. Master Plan

1.5.1. Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

1.5.2. Departmental Representative will review and return revised schedules within 5 Working Days.

1.5.3. Revise impractical schedule and resubmit within 5 Working Days.

1.5.4. Accepted revised schedule will become Master Plan and be used as baseline for updates.

### 1.6. Project Schedule

1.6.1. Develop detailed Project Schedule derived from Master Plan.

1.6.2. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

1.6.2.1. Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table.

1.6.2.2. Dates of Submittals including Shop Drawings, product data, MSDS sheets and samples.

1.6.2.3. Dates of inspection and testing.

1.6.2.4. Final Completion date within the time period in accordance with the Contract, including Amendments.

### 1.7. Project Schedule Reporting

1.7.1. Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

1.7.2. Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

### 1.8. Project Meetings

1.8.1. Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

1.8.2. Weather related delays with their remedial measures will be discussed and negotiated

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Shop Drawings: at least 5 Working Days prior to commencing applicable Work, Submit Shop Drawings signed by a Qualified Professional.

## 1.4. General

1.4.1. Submission details to be commensurate for type of Work and Site conditions. Details depend on Work performed and Contractor's sequence, methods and means.

1.4.2. This section specifies general requirements and procedures for the Contractor’s Submittals of Shop Drawings, product data, samples and other submittals in accordance with the Contract to Departmental Representative. Additional specific requirements for Submittals are identified in individual technical sections.

1.4.3. Present Shop Drawings, product data and samples in SI Metric units.

1.4.4. Where items or information is not produced in SI Metric units, converted values are acceptable.

1.4.5. Contractor’s responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative’s review of Submittals.

1.4.6. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.

1.4.7. Contractor’s responsibility for deviations in Submittals from requirements of Contract is not relieved by the Departmental Representative’s review of Submittals unless Departmental Representative gives written acceptance of specific deviations.

1.4.8. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit as directed by the Departmental Representative.

1.4.9. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those directed by the Departmental Representative.

1.4.10. Do not proceed with Work until relevant Submittals are finalized and have been accepted.

1.4.11. Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to Submit in ample time is responsibility of Contractor.

1.4.12. Review Submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each Submittal has been checked and coordinated with requirements of Work and Contract. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
1.4.13. Verify field measurements and affected adjacent Work are coordinated.
1.4.14. Adjustments made on Submittals by the Departmental Representative will not result in an increase the Contract Amount nor an Extension of Time for completion of the Work. If adjustments result in an increase to the Contract Amount or an Extension of Time for completion of the Work, notify Departmental Representative and receive approval prior to proceeding with Work.
1.4.15. Keep one final copy of each Submittal onsite.

**1.5. Submission Requirements**

1.5.1. Coordinate each Submittal with the requirements of the Work and the Contract. Individual Submittals will not be reviewed until:
1.5.1.1. Submittals are complete.
1.5.1.2. All related information is available.
1.5.2. Allow 10 Working Days for Departmental Representative's review of each Submittal, unless otherwise specified.
1.5.3. All Submittals are to be sent to Departmental Representative in duplicate as a hardcopy and in electronic format compatible with Departmental Representative's software.
1.5.4. Accompany Submittals with On Site Notification:
1.5.4.1. Date.
1.5.4.2. Project title and number.
1.5.4.3. Contractor's name and address.
1.5.4.4. Identification and quantity of each Shop Drawing, product data and sample.
1.5.4.5. Other pertinent data.
1.5.5. Submittals must include:
1.5.5.1. Date and revision dates.
1.5.5.2. Project title and number.
1.5.5.3. Name and address of:
1.5.5.3.1. Subcontractor.
1.5.5.3.2. Supplier.
1.5.5.3.3. Manufacturer.
1.5.5.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.
1.5.5.5. Qualified Professional to sign and seal Submittals in accordance with the Contract. Submittals to include at a minimum 1 hard copy of original ink sealed document.
1.5.5.6. Details of appropriate portions of Work as applicable.

## 1.6. Shop Drawings

1.6.1. Shop Drawings are designs, drawings, figures, diagrams, illustrations, schedules, performance charts, brochures and other data intended to illustrate details of a portion of the Work which are provided by the Qualified Professional of record.

1.6.2. Maximum sheet size: ANSI E (864 x 1118 mm).

1.6.3. Submit, as directed by the Departmental Representative, electronic and 2 hard copies of Shop Drawings for each requirement requested in the specification sections and/or as directed by the Departmental Representative.

1.6.4. Cross-reference Shop Drawing information to applicable portions of the Contract.

1.6.5. Qualified Professional to sign and seal each individual Shop Drawing.

1.6.6. Qualified Professional to sign and seal final Shop Drawings and submit as directed by the Departmental Representative upon Final Completion of the construction project. Final Shop Drawings are prepared by a Qualified Professional to reflect design changes made during the construction of the Remediation by Excavation project. Final Shop Drawings are intended to incorporate addenda, change orders and other significant design changes, but not necessarily Site directions.

1.6.7. Shop Drawings must include:

1.6.7.1. The original date of issue.

1.6.7.2. The dates of all applicable revisions.

1.6.7.3. The project title.

1.6.7.4. The project address.

1.6.7.5. The project number.

1.6.7.6. Wherever applicable, the name(s) of the: Contractor, Subcontractor(s), Supplier(s), manufacturers, and separate detailers.

1.6.7.7. The sequence number for each Shop Drawing.

1.6.7.8. Identifications of all products and materials.

1.6.7.9. Relation to adjacent structures or materials.

1.6.7.10. Clearly identified field dimensions.

1.6.7.11. Applicable standards.

## 1.7. Shop Drawings Review

1.7.1. Departmental Representative's review of Shop Drawings only to determine if Shop Drawings are consistent with the general intent of the Contract and are in accordance with the Contract.

1.7.2. This review will not mean that Departmental Representative approves the detail design inherent in the Shop Drawings, responsibility for which will remain with Contractor submitting same.

1.7.3. This review will not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or of responsibility for meeting all requirements of the Contract.

1.7.4. Without restricting the generality of the foregoing, be responsible for:

1.7.4.1. Dimensions to be confirmed and correlated at the Site.
1.7.4.2. Information that pertains solely to fabrication processes or to techniques of construction and installation.
1.7.4.3. Coordination of the Work of all sub-trades.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used
2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used
3.1.1. Not Used.

**END OF SECTION**

# 4. PART 1 - GENERAL

## 4.1. Measurement Procedures

4.1.1. See 01 11 00.

## 4.2. Definitions

4.2.1. See 01 11 00.

## 4.3. Action and Informational Submittals

4.3.1. List of Signs and Devices: within 10 Working Days after Contract award and prior to mobilization to Site Submit a list of signs and other devices required for the project.

## 4.4. Protection of Public Traffic

4.4.1. Comply with requirements of acts, regulations and bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

4.4.2. Comply with current version of Transportation Association of Canada Guidelines.

4.4.3. Provide and maintain road access and egress to property fronting Site and in other areas in accordance with the Contract, except where other means of road access exist that are accepted.

## 4.5. Informational and Warning Devices

4.5.1. Provide and maintain signs, flashing warning lights, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Work which requires road user response.

4.5.2. Supply and erect signs, delineators, barricades and miscellaneous warning devices to comply with current version of Manual of Uniform Traffic Control Devices for Canada (MUTCDC) and Transportation Association of Canada Guidelines or equivalent.

4.5.3. Place signs and other devices in locations recommended in current version of Manual of Uniform Traffic Control Devices for Canada (MUTCDC) and Transportation Association of Canada Guidelines or equivalent.

4.5.4. Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation onsite changes, revise list for approval.

4.5.5. Continually maintain traffic control devices in use:

4.5.5.1. Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

4.5.5.2. Remove or cover signs which do not apply to conditions existing from day to day.

### 4.6. Control of Public Traffic

4.6.1. Provide competent flag personnel, trained in accordance with, and properly equipped to, current version of Manual of Uniform Traffic Control Devices for Canada (MUTCDC) and Transportation Association of Canada Guidelines or equivalent, for situations as follows:

4.6.1.1. When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

4.6.1.2. In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

### 4.7. Operational Requirements

4.7.1. Maintain existing conditions for traffic throughout period of Contract except that, when required for construction in accordance with the Contract and when measures have been taken in accordance with the Contract and accepted by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:

4.7.1.1. Maintain existing conditions for traffic crossing right-of-way.

## 5. PART 2 - PRODUCTS

### 5.1. Not Used

5.1.1. Not Used.

## 6. PART 3 - EXECUTION

### 6.1. Not Used

6.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Contaminated Material and Non-Contaminated Material Management Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit plan detailing management of Contaminated Material and Non-Contaminated Material. Include:

1.3.1.1. Sequence, methods and means to ensure different categories of waste are segregated.

1.3.1.2. Sequence, methods and means to transport and store Contaminated Material and Non-Contaminated Material onsite.

1.3.1.3. Sequence, methods and means to transport Contaminated Material and Non-Contaminated Material offsite. Include name, vehicle type, and licenses of transporters. For all transfer stations and interim storage facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.1.4. Sequence, methods and means to treat Contaminated Material offsite. Include details on treatment process, disposition of contaminants, and written confirmation from facility owner acknowledging suitability of facility for material to be treated. For all offsite Treatment Facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.1.5. Sequence, methods and means to dispose Contaminated Material and Non-Contaminated Material offsite. Include details on disposal process and written confirmation from facility owner acknowledging suitability of facility for material to be disposed. For all Disposal Facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.2. Transport Manifests: within 5 Working Days of offsite transport, Submit documentation verifying that material has been transported appropriately. Include:

1.3.2.1. Method of transport.
1.3.2.2. Name of transport company.
1.3.2.3. Weigh scale receipt including location, date, and weight of loading, as appropriate.
1.3.2.4. Weigh scale receipt including location, date, and weight of unloading.
1.3.3. Certificate of Treatment: within 30 Working Days of treatment at Treatment Facility, Submit documentation verifying that materials have been treated by Contractor. Include:
1.3.3.1. Issued by the Treatment Facility.
1.3.3.2. On company letterhead.
1.3.3.3. Name and location of facility where the material is being treated.
1.3.3.4. Date and weight for each shipment received and total weight received at the offsite facility.
1.3.3.5. Date and weight for each treatment event and total weight treated at the offsite facility.
1.3.3.6. Treatment methodology.
1.3.3.7. Laboratory certificates demonstrating treatment objectives were met.
1.3.3.8. Disposition of treated material.
1.3.3.9. Signed by identified authorized treatment company representative.
1.3.4. Certificate of Disposal: within 30 Working Days of disposal at Disposal Facility, Submit documentation verifying that materials have been disposed by Contractor. Include:
1.3.4.1. Issued by the Disposal Facility.
1.3.4.2. On company letterhead.
1.3.4.3. Name and location of facility where the material is being disposed.
1.3.4.4. Date and weight for each shipment received and total weight received at the Disposal Facility.
1.3.4.5. Identification of acceptance of final ownership of material.
1.3.4.6. Signed by identified authorized disposal company representative.

## 1.4. Sequencing and Scheduling

1.4.1. Commence Work involving contact with Contaminated or potentially Contaminated Material or Wastewater after all applicable Environmental Protection procedures (including those identified in Contaminated Material and Non-Contaminated Material Management Plan and Environmental Protection Plan) and facilities (including those identified in Site Layout) are operational and accepted by Departmental Representative.
1.4.2. Plan work sequencing and traffic patterns to prevent contamination of clean areas due to traffic or debris.

## 1.5. Equipment Decontamination Facility

1.5.1. Prior to commencing Work involving equipment contact with potentially Contaminated Material, construct equipment decontamination facilities to accommodate the largest potentially contaminated equipment onsite.

1.5.2. Collect and contain equipment decontamination wastewater and sediment. Transfer collected wastewater and sediment to treatment facilities accepted by Departmental Representative.

### 1.6. Personnel Decontamination Facility

1.6.1. Provide an area or areas close to the workers' changing facilities to enable workers and other personnel leaving areas such as exclusion area to remove deleterious and contaminated materials from boots, clothing and skin surfaces.

1.6.2. Be responsible for ensuring that all materials, chemicals, protective clothing, wash water and deleterious materials are collected, treated and disposed of in accordance with applicable environmental standards and regulations.

1.6.3. Personnel Decontamination Facility to be available for use by persons other than the Contractor's workers and Subcontractors, including federal employees, other contractor(s), and environmental agencies. Provide use of facilities to other persons.

### 1.7. Soil Stockpiling

1.7.1. Provide, maintain, and operate temporary storage/stockpiling facilities as per Contractor's Site Layout.

1.7.2. Segregate Contaminated Material from Non-Contaminated Material into separate stockpiles to prevent cross-contamination.

1.7.3. Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each Working Day and as directed by the Departmental Representative.

1.7.4. Securely fasten covers over stockpiled material until material is loaded for offsite transport.

1.7.5. Store excavated Non-Contaminated Material only on non-contaminated surface areas. Ensure no contact between excavated Non-Contaminated Material and drainage of Contaminated Water or Contaminated Material.

1.7.6. Store excavated Contaminated Material in temporary stockpiles.

1.7.6.1. Install impermeable liner (eg asphalt or minimum 20 mil (0.5mm) polyethylene) below proposed stockpile locations to prevent contact between stockpile material and ground.

1.7.6.2. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

1.7.6.3. Prevent Non-Contaminated Water, including surface runoff water, from coming into contact with Contaminated Material stockpiles.

1.7.7. Segregate Contaminated Material into different treatment/disposal streams, including at a minimum:

1.7.7.1. Hazardous Waste

1.7.7.2. Waste Quality

1.7.8. Segregate different suspect material in discrete stockpiles to facilitate ex-situ characterization as directed by the Departmental Representative.

1.7.9. Assist Departmental Representative in collection of stockpile samples for exsitu characterization. Ex-situ characterization may take up to 5 Working Days, not counting the day the sample is collected. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Samples results provided within 5 Working Days, not counting the day the sample is collected.

1.7.10. Do not remove Contaminated Material from stockpiles until exsitu characterization completed and as directed by Departmental Representative.

## 1.8. Equipment Decontamination

1.8.1. At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated.

1.8.2. If required, as directed by the Departmental Representative, use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean area before removing from Site or travelling on clean areas. Perform assessment as directed by the Departmental Representative to determine effectiveness of decontamination.

1.8.2.1. Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

1.8.2.2. Collect decontamination wastewater and sediment which accumulate in decontamination location. Treat collected wastewater as Contaminated Water. Manage decontamination sediment as Hazardous Waste.

1.8.3. In the opinion of the Departmental Representative, each piece of equipment must be inspected by the Departmental Representative after decontamination and prior to travel on clean areas or demobilization from Site. Perform additional decontamination as required in the opinion of the Departmental Representative.

1.8.4. Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

## 1.9. Progress Decontamination

1.9.1. Decontaminate equipment after working in potentially contaminated Work areas and prior to subsequent Work or travel on clean areas.

## 1.10. Final Decontamination

1.10.1. Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially Contaminated Material prior to demobilization from Site.

**1.11. Contaminated Material Management**

1.11.1. Remove all Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.

1.11.2. Minimize generation of Contaminated Material to greatest extent practicable. Take necessary precautions to avoid mixing during excavation, handling, loading, stockpiling, and transport of Non-Contaminated Material with Contaminated Material, and Waste Quality with Hazardous Waste.

1.11.3. Segregate, excavate, handle, stockpile, load, unload, haul, interim storage, treat, and dispose Contaminated Material separately into the following classifications in accordance with the Contract or as directed by the Departmental Representative based on insitu results, field observations, field measurements, and/or ex-situ characterization:

1.11.3.1. Hazardous Waste

1.11.3.2. Waste Quality

1.11.4. Handle, stockpile, load, unload, haul, and interim store Contaminated Material from the Site separately from material from other sites.

1.11.5. Treat and dispose Contaminated Material from the Site separately from material from other sites to the extent practicable as acceptable to the Departmental Representative.

1.11.6. Material characterization additional to information provided in Contract required by transport, Treatment Facility or Disposal Facility responsibility of Contractor.

**1.12. Offsite Contaminated Material Disposition**

1.12.1. Treat and dispose of Contaminated Material offsite as follows, otherwise in accordance with the Contract, or as directed by the Departmental Representative:

1.12.1.1. Hazardous Waste: May be treated at a Treatment Facility prior to disposal at a Disposal Facility. Must be disposed at a Disposal Facility.

1.12.1.2. Waste Quality: May be treated at a Treatment Facility prior to disposal at a Disposal Facility. Must be disposed at a Disposal Facility.

**1.13. Contaminated Material Transport - Owner's Soil Treatment Facility**

1.13.1. Assume ownership of, and be responsible for, Contaminated Material once it is loaded on a vehicle, barge, or other vessel for transport.

1.13.2. Transport material as soon as practical. Do not unreasonably stockpile material onsite.

1.13.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

1.13.4. Excess water in soil or sediment must not be allowed to flow out of vehicle or vessel during transport.
1.13.5. Stabilize soil and sediment as necessary.
1.13.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Hazardous Waste soil and sediment.
1.13.7. Transport material to location shown on Drawings.
1.13.8. Manifest estimated volumes of all material transported from Site to Owner's Soil Treatment Facility. Submit all manifests as directed by the Departmental Representative.

**1.14. Contaminated Material Transport - Offsite**

1.14.1. Assume ownership of, and be responsible for, Contaminated Material once it is loaded on a vehicle, barge, or other vessel for transport.
1.14.2. Transport material as soon as practical. Do not unreasonably stockpile material onsite.
1.14.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.
1.14.4. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
1.14.5. Stabilize material as necessary.
1.14.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Contaminated Material.
1.14.7. Barges must be inspected by an independent Marine Surveyor and Submit a copy of the Certificate of Seaworthiness to Departmental Representative.
1.14.8. Manifest and correlate quantities of all material transported from Site documenting quantity removed from Site, movement, transfer stations, interim storage and treatment, and weight of material at final Disposal Facility. Submit all manifests, as directed by the Departmental Representative.
1.14.9. Material transported with discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
1.14.9.1. No manifest or an incomplete manifest.
1.14.9.2. The material transported does not match the description in the manifest.
1.14.9.3. The amount transported differs by more than 5% in the manifest.
1.14.9.4. The material transported is in a hazardous condition.
1.14.10. Transfer/Interim Storage Facility must:
1.14.10.1. Be an existing offsite facility located in Canada or the United States.
1.14.10.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
1.14.10.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the transfer or interim storage of relevant Contaminated Material.

1.14.10.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.

1.14.11. Facility Authority:

1.14.11.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.

1.14.11.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.

1.14.11.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.

1.14.12. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

**1.15. Contaminated Material Treatment - Offsite**

1.15.1. Assume ownership of, and be responsible for, Contaminated Material treated offsite.

1.15.2. Contaminated Material Treatment - Offsite: treat at Treatment Facility provided by Contractor and accepted by the Departmental Representative.

1.15.3. Offsite Treatment Facility must:

1.15.3.1. Be an existing offsite facility located in Canada or the United States.

1.15.3.2. Be designed, constructed and operated for the handling or processing of waste in such a manner as to change the physical, chemical or biological character or composition of Contaminated Material. Treatment includes bioremediation, thermal desorption, and incineration. Treatment does not include blending, mixing, or dilution

1.15.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the treatment of relevant Contaminated Material.

1.15.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.

1.15.4. Facility Authority:

1.15.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.

1.15.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.

1.15.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.

1.15.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

1.15.5. Treat material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
1.15.6. Material sent to an offsite Treatment Facility must subsequently be disposed of at a Disposal Facility after treatment.
1.15.7. If proposed Treatment Facility is not acceptable to Departmental Representative, provide an alternate Treatment Facility that is acceptable.
1.15.8. Submit Certificates of Treatment for all Contaminated material treated offsite.

**1.16. Contaminated Material Disposal**

1.16.1. Assume ownership of, and be responsible for, Contaminated Material disposed.
1.16.2. Contaminated Material Disposal: dispose Contaminated Material, including offsite treated Contaminated Material that may no longer be contaminated, at Disposal Facility provided by Contractor and accepted by the Departmental Representative.
1.16.3. Disposal Facility must:
1.16.3.1. Be an existing offsite facility located in Canada or the United States.
1.16.3.2. Be designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.
1.16.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the disposal of relevant Contaminated Material.
1.16.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
1.16.4. Facility Authority:
1.16.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
1.16.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
1.16.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
1.16.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
1.16.5. Dispose material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
1.16.6. Material sent to a Disposal Facility must be permanently stored at that facility.
1.16.7. If proposed Disposal Facility is not acceptable to Departmental Representative, provide an alternate Disposal Facility that is acceptable.
1.16.8. Submit Certificates of Disposal for all Contaminated material disposed offsite.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Submit to Departmental Representative Submittals listed for review.
1.3.2. Work affected by Submittal must not proceed until review is complete.
1.3.3. Submit the following:
1.3.3.1. Health and Safety Plan.
1.3.3.2. Copies of reports or directions issued by federal and provincial health and safety inspectors.
1.3.3.3. Copies of incident and accident reports.
1.3.3.4. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
1.3.3.5. Emergency Procedures.
1.3.3.6. Notice of Project.
1.3.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 Working Days after receipt of the plan.
1.3.5. If changes are required, revise the plan as appropriate and resubmit to Departmental Representative within 5 Working Days.
1.3.6. Submittal of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It will not:
1.3.6.1. Be construed to imply approval by the Departmental Representative.
1.3.6.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.
1.3.6.3. Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

## 1.4. References

1.4.1. Government of Canada:
1.4.1.1. Canada Labour Code - Part II.
1.4.1.2. Canada Occupational Health and Safety Regulations.
1.4.2. National Building Code of Canada (NBC):
1.4.2.1. Part 8, Safety Measures at Construction and Demolition Sites.
1.4.3. Canadian Standards Association (CSA) as amended:
1.4.3.1. CSA Z797-2009 Code of Practice for Access Scaffold.

1.4.3.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
1.4.3.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
1.4.4. National Fire Code of Canada 2010 (as amended):
1.4.4.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
1.4.4.2. FCC No. 302, Standard for Welding and Cutting.
1.4.5. American National Standards Institute (ANSI):
1.4.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
1.4.6. Province of British Columbia (as appropriate):
1.4.6.1. Workers Compensation Act Part 3-Occupational Health and Safety.
1.4.6.2. Occupational Health and Safety Regulation.
1.4.7. Yukon Territory (as appropriate):
1.4.7.1. Occupational Health and Safety Act.
1.4.7.2. Workers' Compensation Act.
1.4.7.3. Occupational Health and Safety Regulation

## 1.5. Regulatory Requirements

1.5.1. Comply with codes, acts, bylaws, standards and regulations applicable to the performance of the Work in accordance with the Contract to ensure safe operations at Site.
1.5.2. In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will direct on the course of action to be followed.

## 1.6. Worker's Coverage

1.6.1. Comply fully with the relevant Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the Final Completion of the Work.
1.6.2. Maintain Workers coverage as required by relevant acts and regulations during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

## 1.7. Compliance with Regulations

1.7.1. PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
1.7.2. It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the Work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

## 1.8. Responsibility

1.8.1. Assume responsibility as the Prime Contractor for Work under this Contract.

1.8.1.1. Be responsible for health and safety of persons onsite, safety of property onsite and for protection of persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

1.8.1.2. Comply with and enforce compliance by employees with safety requirements of Contract, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

## 1.9. Health and Safety Coordinator

1.9.1. The Health and Safety Coordinator must:

1.9.1.1. Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the Site to perform Work.

1.9.1.2. Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.

1.9.1.3. Be on Site during execution of Work.

## 1.10. General Conditions

1.10.1. Provide safety barricades and lights around Site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

1.10.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the Site:

1.10.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

## 1.11. Project/Site Conditions

1.11.1. Work at Site will involve contact with contaminants identified in Specifications and environmental reports.

## 1.12. Work Permits

1.12.1. Obtain specialty permits related to project before start of Work.

## 1.13. Filing of Notice

1.13.1. The Prime Contractor must complete and submit a Notice of Project as required by Provincial or Territorial authorities.

1.13.2. Provide copies of all notices to the Departmental Representative.

## 1.14. Health and Safety Plan

1.14.1. Conduct a site-specific hazard assessment based on review of Contract, required Work, and project Site. Identify any known and potential health risks and safety hazards.

1.14.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
1.14.2.1. Primary requirements:
1.14.2.1.1. Contractor's safety policy.
1.14.2.1.2. Identification of applicable compliance obligations.
1.14.2.1.3. Definition of responsibilities for project safety/organization chart for project.
1.14.2.1.4. General safety rules for project.
1.14.2.1.5. Job-specific safe work procedures.
1.14.2.1.6. Inspection policy and procedures.
1.14.2.1.7. Incident reporting and investigation policy and procedures.
1.14.2.1.8. Occupational Health and Safety Committee/Representative procedures.
1.14.2.1.9. Occupational Health and Safety meetings.
1.14.2.1.10. Occupational Health and Safety communications and record keeping procedures.
1.14.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.
1.14.2.3. List hazardous materials to be brought onsite as required by Work.
1.14.2.4. Indicate engineering and administrative control measures to be implemented at the Site for managing identified risks and hazards.
1.14.2.5. Identify personal protective equipment (PPE) to be used by workers.
1.14.2.6. Identify personnel and alternates responsible for site safety and health.
1.14.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.
1.14.3. Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.
1.14.4. Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
1.14.5. Departmental Representative's review: the review of Health and Safety Plan by Public Service and Procurement Canada (PWGSC) will not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract.

**1.15. Emergency Procedures**
1.15.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (ie names/telephone numbers) of:
1.15.1.1. Designated personnel from own company.
1.15.1.2. Regulatory agencies applicable to Work and as per legislated regulations.
1.15.1.3. Local emergency resources.
1.15.1.4. Departmental Representative and site staff.

1.15.2. Include the following provisions in the emergency procedures:
1.15.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
1.15.2.2. Evacuate all workers safely.
1.15.2.3. Check and confirm the safe evacuation of all workers.
1.15.2.4. Notify the fire department or other emergency responders.
1.15.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
1.15.2.6. Notify Departmental Representative and Site staff.
1.15.3. Provide written rescue/evacuation procedures as required for, but not limited to:
1.15.3.1. Work at high angles.
1.15.3.2. Work in confined spaces or where there is a risk of entrapment.
1.15.3.3. Work with hazardous substances.
1.15.3.4. Underground work.
1.15.3.5. Work on, over, under and adjacent to water.
1.15.3.6. Workplaces where there are persons who require physical assistance to be moved.
1.15.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
1.15.5. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

**1.16. Hazardous Products**
1.16.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
1.16.2. Where use of hazardous and toxic products cannot be avoided:
1.16.2.1. Notify Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as required.
1.16.2.2. As required, in conjunction with Departmental Representative, schedule to carry out Work during "off hours" when tenants have left the building.
1.16.2.3. Provide adequate means of ventilation as required.

**1.17. Unforeseen Hazards**
1.17.1. Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the Work, immediately stop Work and notify the Departmental Representative verbally and in writing.

**1.18. Posted Documents**
1.18.1. Post legible versions of the following documents onsite:
1.18.1.1. Health and Safety Plan.
1.18.1.2. Sequence of Work.
1.18.1.3. Emergency procedures.

1.18.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
1.18.1.5. Notice of Project.
1.18.1.6. Floor plans or Site plans.
1.18.1.7. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the Site for review by employees and workers.
1.18.1.8. Workplace Hazardous Materials Information System (WHMIS) documents.
1.18.1.9. Material Safety Data Sheets (MSDS).
1.18.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
1.18.2. Post all Material Safety Data Sheets (MSDS) onsite, in a common area, visible to all workers and in locations accessible to tenants when Work of this Contract includes construction activities adjacent to occupied areas.
1.18.3. Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as accepted by the Departmental Representative.

**1.19. Meetings**

1.19.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
1.19.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
1.19.2.1. Sign-in of all attendees.
1.19.2.2. Planned Work activities and environmental considerations for that shift.
1.19.2.3. Hazards associated with these Work activities, including environmental hazards (eg potential for hypothermia, heat exhaustion, heat stroke).
1.19.2.4. Appropriate job-specific safe work procedures.
1.19.2.5. Required personal protective equipment (PPE).
1.19.2.6. Appropriate emergency procedures.
1.19.2.7. Review recent accidents on Site, including near misses.
1.19.3. Retain records of all health and safety meetings onsite during Work, and retain as corporate records for a minimum of 7 years after Work is completed.

**1.20. Correction of Non-Compliance**

1.20.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
1.20.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
1.20.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time.
1.20.4. Correct non-compliance.

## 1.21. Hazardous Occurrence Investigation and Reporting

1.21.1. Hazard includes:

1.21.1.1. Any source of potential damage, harm or adverse effects on life, health, property or environment at work. It refers to any biological, chemical, ergonomic, physical, psychosocial and safety factor that is reasonably likely to cause harm or damage to humans, other organisms, or the environment in the absence of its control. Sometimes a hazard is referred to as being the actual harm or the health effect it caused rather than the hazard. For example the disease tuberculosis might be called a hazard by some but in general the tuberculosis-causing bacteria would be considered the “hazard” or “hazardous biological agent”. Exposure to tuberculosis would be the hazardous incident. For types of Hazards refer to Annex 3 of the Standard on Hazard Prevention Program.

1.21.2. Hazardous Occurrence includes:

1.21.2.1. An event occurring at a PWGSC managed building or worksite, or through the course of an employee's work that results in, or has the potential to result in, a fatality, injury, illness, exposure to a hazardous substance or property damage or an escapement of a hazardous material. For the purpose of investigating, recording and reporting hazardous occurrences, the following are included under this term: disabling injuries, minor injuries and near-misses.

1.21.3. Hazardous Occurrence Investigation and Reporting Procedures:

1.21.3.1. Includes information regarding the person involved and the basic circumstances surrounding the hazardous occurrence.

1.21.3.2. Provides a detailed and thorough description of the hazardous occurrence and the sequence of events.

1.21.3.3. Indicates corrective measures that have been taken since the occurrence.

1.21.3.4. Requires the appointment of a qualified investigator.

1.21.3.5. Provides recommendations for additional corrective measures, if required.

1.21.4. Fatal or Serious Accidents Procedures:

1.21.4.1. Call emergency number to advise the police organization having jurisdiction to secure the scene and investigate the matter.

1.21.4.2. Advise the Departmental Representative of the fatality or serious accident within 1 hour.

1.21.4.3. No investigation will be conducted at the scene until the police service having jurisdiction has released the scene.

1.21.4.4. Unless authorized to do so, do not allow anyone to remove or in any way interfere with or disturb any wreckage, article or thing related to the incident except to the extent necessary to: save a life, prevent injury or relieve human suffering in the vicinity; maintain an essential public service; or prevent unnecessary damage to or loss of property.

## 1.22. Utility Clearance

1.22.1. Contractor is solely responsible for utility clearance.

1.22.2. Contractor will not rely upon Drawings or other information provided with utility locations.

**1.23. Personal Protective Equipment Program**

1.23.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing as appropriate:

1.23.1.1. Donning and doffing procedures.
1.23.1.2. PPE selection based upon Site hazards.
1.23.1.3. PPE use and limitations of equipment.
1.23.1.4. Work mission duration, PPE maintenance and storage.
1.23.1.5. PPE decontamination and disposal.
1.23.1.6. PPE inspection procedures prior to, during, and after use.
1.23.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
1.23.1.8. Medical surveillance requirements for personnel assigned to work at Site.
1.23.1.9. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
1.23.1.10. Site control measures employed at Site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
1.23.1.11. Decontamination procedures for both personnel and equipment.
1.23.1.12. Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.
1.23.1.13. Written respiratory protection program for project activities.
1.23.1.14. Procedures dealing with heat and/or cold stress.
1.23.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

**1.24. Offsite Contingency and Emergency Response Plan**

1.24.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.
1.24.2. Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.

**1.25. Personnel Health, Safety, and Hygiene**

1.25.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

1.25.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.

1.25.3. Personal Protective Equipment:

1.25.3.1. Ensure all site personnel are furnished with appropriate PPE.

1.25.3.2. Unless identified otherwise in site-specific health and safety plan, minimum PPE to include: industrial protective headwear, high-visibility safety apparel, and protective footwear.

1.25.3.3. Ensure that safety equipment and protective clothing is kept clean and maintained.

1.25.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:

1.25.4.1. Ensure industrial protective headwear is of appropriate CSA Standard and meets other appropriate standards.

1.25.4.2. Ensure high-visibility safety apparel is of appropriate CSA Standard and meets other appropriate standards.

1.25.4.3. Ensure protective footwear is of appropriate CSA Standard and meets other appropriate standards.

1.25.4.4. Dispose of or decontaminate PPE worn onsite at end of each workday.

1.25.4.5. Decontaminate reusable PPE before reissuing.

1.25.4.6. Ensure site personnel have passed respirator fit test prior to entering potentially volatile contaminated work areas, as appropriate.

1.25.4.7. Ensure facial hair does not interfere with proper respirator fit.

1.25.5. Respiratory Protection:

1.25.5.1. Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.

1.25.5.2. Develop, implement, and maintain respirator program.

1.25.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.

1.25.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.

1.25.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.

1.25.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.

1.25.5.7. Ensure appropriate respiratory protection during Work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.

1.25.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.

1.25.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:

1.25.7.1. Suitable containers for storage and disposal of used disposable PPE.

1.25.7.2. Potable water and suitable sanitation facility.

1.25.8. Emergency and First-Aid Equipment:

1.25.8.1. Locate and maintain emergency and first-aid equipment in appropriate location onsite including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.

1.25.9. Site Communications:

1.25.9.1. Identify, supply and implement appropriate dedicated communication devices for Site and post emergency numbers near dedicated devices.

1.25.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.

1.25.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.

1.25.9.4. Furnish selected personnel with 2-way radios.

1.25.9.5. Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Environmental Protection Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing protection of the environment. Include:

1.3.1.1. Comprehensive overview of known or potential environmental issues to be addressed during Work.

1.3.1.2. Identify requirements that plan complies with. Includes: permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.

1.3.1.3. Names and qualifications of persons responsible for ensuring adherence to Environmental Protection Plan.

1.3.1.4. Names and qualifications of persons responsible for manifesting material to be removed from Site.

1.3.1.5. Names and qualifications of persons responsible for training Site personnel.

1.3.1.6. Description of Environmental Protection personnel training program.

1.3.1.7. Work Area Plan showing proposed activity in each portion of areas, such as exclusion zone(s), decontamination zone(s) and clean zone(s), and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas.

1.3.1.8. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials onsite.

1.3.1.9. Historical, Archaeological, Cultural Resources, Biological Resources and Wetlands Plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands. Include procedures if previously unknown historical, archaeological, cultural, and biological resources are discovered during Work.

1.3.1.10. Noise Control Plan identifying methods and procedures for preventing, monitoring, and controlling noise for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: noise does not comply with appropriate

levels, or if there are public complaints. Plan to be for type of Work and Site conditions.

1.3.1.11. Vibration Control Plan identifying methods and procedures for preventing, monitoring, and controlling vibration for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: vibration does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.

1.3.1.12. Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to prevent mud transported onto public roads by vehicles or runoff, and mitigation measures if mud is transported onto public roads by vehicles or runoff. Vehicles and vehicle traffic must comply with all federal, provincial, and municipal laws and regulations.

1.3.1.13. Contamination Prevention Plan identifying hazardous, deleterious or regulated substances to be used onsite; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with federal, provincial, and municipal laws and regulations for storage and handling of these materials.

1.3.1.14. Spill Control Plan including procedures, instructions, and reports to be used in event of spill of hazardous, deleterious or regulated substances. Identify locations and contents of spill kits.

1.3.1.15. Communications Plan identifying emergency contact list and conditions for implementing emergency contact. Emergency contact to include: Contractor emergency response team including Superintendent; Departmental Representative and alternate, and other contractor(s) and individuals as directed by the Departmental Representative; and federal, provincial, and municipal emergency contacts.

1.3.1.16. Air Pollution Control Plan detailing provisions to assure that contaminants, dust, debris, materials, and trash, are contained onsite. Include procedures, in accordance with the Contract, if air pollution does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.

1.3.1.17. Non-Contaminated Material Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Landfill Facility.

1.3.1.18. Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, federal, provincial, and municipal laws and regulations.

1.3.2. Pollution Control Procedures Modification: immediately when pollution control procedures are inadequate, as directed by the Departmental Representative, Submit modified procedures to resolve problem.

1.3.3. Pollution Control Remediation: immediately when soil, sediment or water contaminated by Contractor's activities are inadequate as directed by the Departmental Representative, Submit remediation procedures.

1.3.4. Dust and Particulate Control Procedures Modification: immediately when dust and particulate control measures are inadequate as directed by the Departmental Representative, Submit modified procedures to resolve problem.

**1.4. Fires**

1.4.1. Fires and burning of rubbish onsite not permitted.

**1.5. Cleaning**

1.5.1. Maintain cleanliness of Work and surrounding Site to comply with federal, provincial, and municipal fire and safety laws, ordinances, codes, and regulations applicable to the performance of the Work.

1.5.2. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.5.3. Ensure cleanup of the Work areas each day after Final Completion of Work.

**1.6. Site Clearing and Plant Protection**

1.6.1. Minimize stripping of Topsoil and vegetation.

1.6.2. Restrict tree and plant removal to areas in accordance with the Contract or as directed by the Departmental Representative. Protect all other trees and plants onsite and offsite.

1.6.3. Salvage all trees and plants to be removed in accordance with the Contract or as directed by the Departmental Representative.

1.6.4. Wrap salvaged trees in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.

1.6.5. Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

**1.7. Vibration**

1.7.1. Maintain acceptable vibration levels not injurious to public health or safety, to the environment, to onsite or offsite property, or to any part of Work completed or under construction.

**1.8. Noise**

1.8.1. Maintain acceptable noise levels not injurious to public health or safety or to the environment.

## 1.9. Maintenance of Public Roads

1.9.1. Prevent tracking or spilling of debris or material onto public roads.
1.9.2. Immediately sweep or scrape up debris or material on public roads.
1.9.3. Clean public roads within a 200 m radius of the Site entrance at least once per shift.

## 1.10. Pollution Control

1.10.1. Pollution includes spills or other releases from Contractor's activities that could potentially contaminate soil, sediment, water, and atmosphere from discharge of hazardous, deleterious or regulated substances, including from equipment and material handling.
1.10.2. Provide sequence, methods and means, and facilities to prevent spills or releases.
1.10.2.1. Maintain temporary erosion and pollution control features.
1.10.2.2. Do not store fuel onsite other than tanks forming part of the equipment.
1.10.2.3. Control emissions from equipment and plant to meet applicable authorities' emission requirements.
1.10.2.4. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.
1.10.3. Inadequate procedures:
1.10.3.1. Stop relevant Work if procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract.
1.10.3.2. Submit procedures proposed to resolve problem.
1.10.3.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause spills or other releases.
1.10.3.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated quantities or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
1.10.4. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.
1.10.5. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.
1.10.5.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.
1.10.5.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.
1.10.5.3. Spill kits are to be in close proximity to machinery.
1.10.5.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.
1.10.6. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

1.10.7. Promptly report spills and releases potentially causing damage to environment to:

1.10.7.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.

1.10.7.2. Contractor emergency response team including Superintendent

1.10.7.3. Departmental Representative and other contractor(s) and individuals as directed by the Departmental Representative.

1.10.8. Departmental Representative can collect samples for chemical analyses prior to, during, and upon Final Completion of Work to monitor potential pollution caused by Contractor's activities. Assist Departmental Representative in collection of samples.

1.10.9. Remediation of soil, sediment or water contaminated by Contractor's activities.

1.10.9.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.

1.10.9.2. Remediation includes excavation, pumping, testing, transport, treatment and disposal as appropriate for the type of contamination incurred, and at a minimum in accordance with the Contract.

1.10.9.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.

1.10.9.4. Remediate as directed by the Departmental Representative.

1.10.9.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.

**1.11. Dust and Particulate Control**

1.11.1. Execute Work by methods to minimize raising dust from construction operations.

1.11.2. Prevent fugitive dust from the Site from interfering with onsite and offsite uses.

1.11.3. Prevent dust from spreading to neighbouring properties.

1.11.4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, excavations, and stockpiles.

1.11.5. Implement and maintain dust and particulate control measures immediately as directed by the Departmental Representative during Work and in accordance with regulations and in accordance with the Contract.

1.11.6. Provide positive means to prevent airborne dust from dispersing into atmosphere. Use fresh (non-saline) water for dust and particulate control.

1.11.7. As minimum, use appropriate covers on vehicles, including trucks, barges, and trains, hauling fine or dusty material. Use watertight vehicles to haul wet materials.

1.11.8. Inadequate procedures:

1.11.8.1. Stop relevant Work if dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract.

1.11.8.2. Submit procedures proposed to resolve problem.
1.11.8.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause release of dusts or particulates.
1.11.8.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent release of dusts or particulates, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

**1.12. Non-Contaminated Material Removal**

1.12.1. Remove all Non-Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.
1.12.2. Remove surplus materials and temporary facilities from Site.
1.12.3. Dispose waste offsite.
1.12.4. Do not burn or bury any waste onsite.
1.12.5. Do not discharge wastes into streams or waterways.
1.12.6. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

**1.13. Sewage Wastewater**

1.13.1. Store Sewage Wastewater from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.
1.13.2. Provide, operate, and maintain Sewage Wastewater storage tanks to store Sewage Wastewater.
1.13.3. Transport and dispose of Sewage Wastewater at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.
1.13.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage Wastewater to Site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain approval prior to discharge of Sewage Wastewater.

**1.14. Wastewater Control**

1.14.1. Dewater various parts of Work including, without limitation, excavations, structures, foundations, and Work areas.
1.14.2. Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
1.14.3. Direct surface waters that have not contacted potentially Contaminated Materials to surface drainage systems.
1.14.4. Control surface drainage including ensuring that gutters are kept open, wastewater is not allowed across or over pavements or sidewalks except through

accepted pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

**1.15. Non-Contaminated Water Disposal**

1.15.1. Dispose of Non-Contaminated Water in manner not injurious to public health or safety, to the environment, to onsite or offsite property, or to any part of Work completed or under construction.

1.15.2. Control disposal or runoff of Non-Contaminated Water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.15.3. Ensure pumped Non-Contaminated Water into waterways, sewer or drainage systems is free of suspended materials. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas

1.15.4. Obtain permits to discharge Non-Contaminated Water to environment or Municipal sewers.

1.15.5. Do not discharge water which may have come in contact with potentially Contaminated Material or otherwise be Contaminated directly offsite to the environment or to municipal sewers.

**1.16. Erosion and Sediment Control**

1.16.1. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other Work areas. Prevent erosion and sedimentation.

1.16.2. Minimize amount of bare soil or sediment exposed at one time. Stabilize disturbed soil or sediment as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by the Departmental Representative.

1.16.3. Provide and maintain temporary erosion and sediment control measures.

1.16.3.1. Temporary erosion and sediment control measures are required to prevent erosion and migration of silt, mud, sediment, and other debris offsite or to other areas of Site where damage might result, or that might otherwise be required by laws and regulations.

1.16.3.2. Temporary erosion and sediment control measures include: silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, dikes, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition.

1.16.3.3. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by the Departmental Representative

1.16.3.4. Place silt fences and/or hay or straw bales in ditches to prevent sediment from escaping from ditch terminations.
1.16.3.5. Do not construct bale barriers and silt fence in flowing streams or in swales.
1.16.3.6. Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.
1.16.3.7. Bales and/or silt fence can be removed at beginning of Working Day, replace at end of Working Day.
1.16.3.8. Repair damaged bales, end runs, and undercutting beneath bales.
1.16.3.9. Unless directed by the Departmental Representative, remove temporary erosion and sediment control devices upon Final Completion of Work. Temporary erosion and sediment control devices once removed become property of Contractor.
1.16.4. Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.
1.16.5. Construct fill areas to prevent erosion.
1.16.6. Do not disturb existing embankments or embankment protection in accordance with the Contract.
1.16.7. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
1.16.8. If soil, sediment and debris from Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where it is undesirable, remove accumulation and restore area to original condition, as directed by the Departmental Representative.

**1.17. Work In or Adjacent to Waterways**

1.17.1. Approvals and Practices:
1.17.1.1. Obtain Discharge Approval prior to commencing work which may impact waterways.
1.17.1.2. As required, comply with Fisheries Act Authorization and other relevant authorizations and in accordance with the Contract.
1.17.1.3. Follow practices described in Fisheries and Oceans Canada (September 1993) Land Development Guidelines for the Protection of Aquatic Habitat.
1.17.1.4. Follow practices described in BC Ministry of Environment (March 2004) Standards and Best Practices for Instream Works.
1.17.2. Timing
1.17.2.1. Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
1.17.2.2. Minimize duration of in-water work.
1.17.2.3. Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
1.17.2.4. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

1.17.3. Site Selection

1.17.3.1. Design and plan activities and works in wetland and waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.

1.17.3.2. Design and construct approaches to wetland and waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.

1.17.3.3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.

1.17.3.4. Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.

1.17.4. Contaminant and Spill Management

1.17.4.1. Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.

1.17.4.2. Develop a response plan and implement immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.

1.17.4.3. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

1.17.5. Erosion and Sediment Control

1.17.5.1. Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the wetland or waterbody during all phases of the project. Maintain erosion and sediment control measures until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the wetland or waterbody or settling basin and runoff water is clear.

1.17.6. Erosion and Sediment Control Plan includes:

1.17.6.1. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.

1.17.6.2. Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. This includes pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.

1.17.6.3. Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).

1.17.6.4. Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.

1.17.6.5. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
1.17.6.6. Repairs to erosion and sediment control measures and structures if damage occurs.
1.17.6.7. Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
1.17.7. Shoreline/Bank Re-vegetation and Stabilization
1.17.7.1. Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction.
1.17.7.2. When practicable, prune or top the vegetation instead of grubbing/uprooting.
1.17.7.3. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
1.17.7.4. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
1.17.7.5. Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
1.17.7.6. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
1.17.7.7. Remove all construction materials from site upon project completion.
1.17.8. Aquatic Life Protection
1.17.8.1. Ensure that all in-water activities, or associated in-water structures, do not interfere with aquatic life passage, constrict the channel width, or reduce flows.
1.17.8.2. Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
1.17.8.3. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
1.17.8.4. Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
1.17.9. Operation of Machinery

1.17.9.1. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
1.17.9.2. Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
1.17.9.3. Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
1.17.9.4. Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
1.17.9.5. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water

**1.18. Noncompliance**

1.18.1. Departmental Representative will inform Contractor in writing of observed noncompliance with federal, provincial or municipal environmental laws, regulations, permits, or other environmental procedure violations.
1.18.2. After receipt of notice, inform the Departmental Representative of the proposed corrective action. Corrective action will be subject to acceptance of Departmental Representative.
1.18.2.1. Do not take action until after receipt of written acceptance.
1.18.3. Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

## 2. PART 2 - PRODUCTS

**2.1. Not Used**

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

**3.1. Not Used**

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Permits: at least 10 Working Days prior to mobilization to Site, Submit copies of all permits, certificates, approvals, or any other form of authorizations and all reporting required.

## 1.4. Laws, Regulations, Permits

1.4.1. Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.

1.4.2. Provincial, territorial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.4.3. Comply with certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have already been obtained.

1.4.4. Obtain and pay for certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have not already been obtained or that are required to be amended.

1.4.5. Provide applicable authorities with plans and information required for issue of acceptance certificates.

1.4.6. Furnish inspection certificates in evidence that the Work installed conforms with the requirements of the authority having jurisdiction.

## 1.5. Codes, Bylaws, Standards

1.5.1. Meet or exceed requirements of Contract, standards, and codes applicable to the performance of the Work and referenced documents.

1.5.2. In any case of conflict or discrepancy, the most stringent requirements will apply.

1.5.3. Perform Work in accordance with the National Building Code of Canada (NBC), and other requirements or codes in accordance with the Contract, construction

standards and/or any other code or bylaw applicable to the performance of the Work.

1.5.4. Certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work: see 01 11 00.

1.5.5. Comply with all attachments, references, and reports relevant to Work, including environmental protection.

### 1.6. Smoking Environment

1.6.1. Smoking on the Site is not permitted.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Inspection and Test Reports: within 5 Working Days of receipt, Submit 2 copies of inspection and test reports to Departmental Representative.

## 1.4. Quality of Work

1.4.1. Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman, or Qualified Professional.

1.4.2. Meet or exceed standards set out in the National Building Code of Canada as applicable for workmanship, erection methods and procedures.

1.4.3. In cases of dispute, perform Work to standard or quality in accordance with any decisions by the Departmental Representative.

1.4.4. Follow Departmental Representative's directions to meet the Quality of Work in accordance with the Contract at no increase to the Contract Amount and no increase to Extension of Time for completion of the Work. Quality of Work includes addressing comments on Submittals, modifying environmental procedures, and preventing or remediating contaminated material spills.

## 1.5. Quality Management

1.5.1. Be responsible for all Quality Assurance and Quality Control during the performance of the Work.

1.5.2. Quality Assurance and Quality Control includes monitoring, inspecting, testing, documenting and reporting the means, methods, materials, workmanship, processes, and products of all aspects of the Work, including design, construction, and management as necessary to ensure conformance with the Contract.

1.5.3. Assist Departmental Representative in quality audit inspections and submit all indicated information within 5 Working Days of collection or as directed.

## 1.6. Inspection

1.6.1. Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Site, allow access to such Work whenever it is in progress. Work at locations other than Site includes offsite Transportation (eg transfer stations), Treatment, and Disposal Facilities.

1.6.2. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative directions, or law of Site.

1.6.3. If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

1.6.4. Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

**1.7. Independent Inspection Agencies**

1.7.1. Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

1.7.2. Provide equipment required for executing inspection and testing by appointed agencies.

1.7.3. Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

1.7.4. If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

**1.8. Access to Work**

1.8.1. Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

1.8.2. Co-operate to provide reasonable facilities for such access.

**1.9. Procedures**

1.9.1. Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

1.9.2. Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

1.9.3. Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

**1.10. Rejected Work**

1.10.1. Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

1.10.2. Make good other Contractor's work damaged by such removals or replacements promptly.
1.10.3. If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, PWGSC will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

**1.11. Reports**
1.11.1. Provide copies of inspection and test reports to subcontractor of work being inspected or tested.

**1.12. Tests and Mix Designs**
1.12.1. Furnish test results and mix designs as requested.
1.12.2. Test results must be signed by Qualified Professional.
1.12.3. The Departmental Representative may require, and pay for, additional inspection and testing services not included above.

## 2. PART 2 - PRODUCTS

**2.1. Not Used**
2.1.1. Not Used.

## 3. PART 3 - EXECUTION

**3.1. Not Used**
3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Site Layout: within 10 Working Days after Contract award and prior to mobilization to Site, Submit Site Layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor. Include:

1.3.1.1. Equipment and personnel decontamination areas.

1.3.1.2. Means of ingress, egress and temporary traffic control.

1.3.1.3. Equipment and material staging areas.

1.3.1.4. Stockpile areas and construction details, including base preparation and water control features.

1.3.1.5. Exclusion areas, contaminant handling areas, and other areas identified in Contractor's site-specific Health and Safety Plan and Environmental Protection Plan.

1.3.1.6. Grading, including contours, required to construct temporary facilities.

1.3.1.7. Location of all temporary facilities including: Contaminated Water Treatment Plant, truck wash and decontamination units, office trailers, modular camp structures, parking, storage, environmental monitoring stations, above ground and underground utilities, and temporary facilities and roads.

1.3.2. Signs: at least 5 Working Days prior to posting, Submit any signs viewable by public.

## 1.4. Utilities

1.4.1. Utilities not identified as being available on Site must be supplied at the Contractor’s expense. Provide supplied utilities for entire work force, including Subcontractors and Departmental Representative and their consultants

## 1.5. Fire Protection

1.5.1. Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

## 1.6. Access and Delivery

1.6.1. Only the designated entrance in accordance with the Contract can be used for access to Site.

1.6.1.1. Maintain for duration of Contract.

1.6.1.2. Make good damage resulting from Contractor’s use.

1.6.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

**1.7. Installation and Removal**

1.7.1. Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
1.7.2. Identify areas which have to be graveled or otherwise treated to prevent tracking of mud.
1.7.3. Indicate use of supplemental or other staging area.
1.7.4. Provide construction facilities in order to execute work expeditiously.
1.7.5. Provide temporary utilities in order to execute Work expeditiously.
1.7.6. Remove from Site all such Work after use.

**1.8. Site Storage/Loading**

1.8.1. Confine work and operations of employees in accordance with the Contract. Do not unreasonably encumber premises with products.
1.8.2. Storage space must be limited to the Site.
1.8.3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

**1.9. Construction Parking**

1.9.1. Parking of private vehicles will not be permitted on Site.
1.9.2. Provide and maintain adequate access to project site.

**1.10. Security**

1.10.1. Be responsible security of site and contents of site after working hours and during holidays.
1.10.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative

**1.11. Equipment, Tools and Materials Storage**

1.11.1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
1.11.2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

**1.12. Sanitary Facilities**

1.12.1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
1.12.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

### 1.13. Protection and Maintenance of Traffic

1.13.1. Provide access and temporary relocated roads as necessary to maintain traffic.
1.13.2. Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
1.13.3. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
1.13.4. Protect travelling public from damage to person and property.
1.13.5. Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
1.13.6. Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
1.13.7. Construct access and haul roads necessary.
1.13.8. Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic must be avoided.
1.13.9. Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
1.13.10. Dust control: adequate to ensure safe operation at all times.
1.13.11. Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
1.13.12. Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
1.13.13. Provide snow removal during period of Work.
1.13.14. Remove, upon completion of work, haul roads designated by Departmental Representative.

### 1.14. Clean-Up

1.14.1. Remove construction debris, waste materials, packaging material from work site daily.
1.14.2. Clean dirt or mud tracked onto paved or surfaced roadways.
1.14.3. Store materials resulting from demolition activities that are salvageable.
1.14.4. Stack stored new or salvaged material not in construction facilities.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

## 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Product Data: at least 5 Working Days prior to use, Submit data on products to be used in Work. Include:

1.3.1.1. Manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other information in accordance with the Contract.

1.3.1.2. Delete information not applicable to project.

1.3.1.3. Supplement standard information to provide details applicable to project.

1.3.1.4. Cross-reference product data information to applicable portions of Contract.

1.3.2. Substitution: at least 5 Working Days prior to use and after Contract award, Submit proposals for substituting products, if required. Include statements of respective costs of items originally in accordance with the Contract and the proposed substitution.

1.3.3. Quality of Work: at least 5 Working Days prior to Work, Submit alternate means to meet or correct quality of work, if required.

## 1.4. Products, Material and Equipment

1.4.1. Use new products, material and equipment in accordance with the Contract. The term "products" is referred to throughout the specifications.

1.4.2. Use products of one manufacturer for material and equipment of the same type or classification in accordance with the Contract.

1.4.3. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation method in accordance with the Contract s.

1.4.4. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document must be followed.

1.4.5. Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

1.4.6. Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from Site.

1.4.7. Store products in accordance with Suppliers' instructions.

## 1.5. Quality of Products

1.5.1. Products, materials and equipment (referred to as products) incorporated into Work must be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. As directed by the Departmental Representative, furnish evidence as to type, source, and quality of the products provided.
1.5.2. Defective products will be rejected regardless of previous inspections.
1.5.2.1. Inspection does not relieve responsibility, but is precaution against oversight or error.
1.5.2.2. Remove and replace defective products.
1.5.3. Retain purchase orders, invoices and other documents to prove that all products utilized in the Work meet the requirements of the Contract. Produce documents as directed by the Departmental Representative.
1.5.4. Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative in accordance with the Contract.
1.5.5. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

## 1.6. Availability of Products

1.6.1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.
1.6.2. If delays in supply of products are foreseeable, Notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
1.6.3. In event of failure to Notify Departmental Representative at the start of Work and should it subsequently appear that the Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character.

## 1.7. Manufacturer's Instructions

1.7.1. Install or erect products in accordance with the manufacturer's instructions in accordance with the Contract.
1.7.1.1. Do not rely on labels or enclosures provided with products.
1.7.1.2. Obtain written instructions directly from the manufacturer.
1.7.2. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document must be followed.
1.7.3. Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to instruct the removal and re-installation.

## 1.8. Contractor's Options for Selection of Products for Tendering

1.8.1. Products specified by "Prescriptive" specifications: select any product meeting or exceeding requirements in accordance with the Contract.

1.8.2. Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.
1.8.3. Products specified to meet particular design requirements or to match existing materials: use only material in accordance with the Contract.
1.8.4. When products are specified by a referenced standard or by performance specifications, as directed by the Departmental Representative obtain from manufacturer and independent laboratory report showing that the product meets or exceeds the requirements in accordance with the Contract.

**1.9. Storage, Handling and Protection**

1.9.1. Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
1.9.2. Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.
1.9.3. Store products subject to damage from weather in weatherproof enclosures.
1.9.4. Remove and replace damaged products as directed by the Departmental Representative.

**1.10. Transportation**

1.10.1. Pay costs of transportation of products required in performance of Work.
1.10.2. Transport products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
1.10.3. Transport products subject to damage from weather in weatherproof enclosures.
1.10.4. Transport in an efficient manner that does not cause delays to the Work schedule.

**1.11. Quality of Work**

1.11.1. Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately Notify Departmental Representative if required Work is such as to make it impractical to produce results in accordance with the Contract. Provide alternate means to meet or correct quality of work, as accepted by the Departmental Representative.
1.11.2. Do not employ anyone unskilled in their required duties.
1.11.3. Perform Work to standard of fitness of Quality of Work in accordance with any decision by the Departmental Representative.

**1.12. Coordination**

1.12.1. Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

**1.13. Remedial Work**

1.13.1. Perform remedial Work required to repair or replace parts or portions of Work as directed by the Departmental Representative as defective or unacceptable. Coordinate adjacent affected Work as required.
1.13.2. Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

### 1.14. Storage Tanks

1.14.1. Abide by the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations for stored petroleum products and allied petroleum products tank system located on federal or Aboriginal land, or within federal jurisdiction as described in the regulations.
1.14.2. Temporary storage tanks subject to the regulations must be registered with Environment Canada.
1.14.3. Mobile tanks subject to the regulations must be certified to be mobile.
1.14.4. Storage tanks to meet the following minimum requirements:
1.14.4.1. Corrosion protection.
1.14.4.2. Secondary containment.
1.14.4.3. Containment sumps, if applicable.
1.14.4.4. Overfill protection.
1.14.5. All components of tank system must bear certification marks indicating that they conform to the standards set out in the regulations.
1.14.6. Product transfer area must be designed to contain spills.
1.14.7. Prepare an emergency plan.
1.14.8. Prior to first filling, storage tanks must:
1.14.8.1. Be registered.
1.14.8.2. Be certified and marked.
1.14.8.3. Transfer area be constructed.
1.14.8.4. Emergency plan in place.

## 2. PART 2 - PRODUCTS

### 2.1. Asbestos Containing Materials Prohibition

2.1.1. Any material containing any degree of asbestos is banned from use in any and all sites, designs and projects.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Preconstruction Condition Survey: within 10 Working Days prior to mobilization to Site, Submit Preconstruction Condition Survey of existing structures, utilities and surface features.

1.3.2. Preconstruction As-Built Documents: at least 5 Working Days prior to mobilization to Site, Submit preconstruction as-built documents prepared by a Land Surveyor.

## 1.4. Survey Reference Points

1.4.1. Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

1.4.2. Make no changes or relocations without prior written notice to Departmental Representative.

1.4.3. Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

1.4.4. Require surveyor to replace control points in accordance with original survey control.

## 1.5. Survey Requirements

1.5.1. Establish permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

1.5.2. Establish lines and levels, locate and lay out, by instrumentation planned excavation limits.

1.5.3. Stake for grading, fill.

## 1.6. Existing Services

1.6.1. Size, depth and location of existing utilities and structures as specified are for guidance only. Completeness and accuracy are not guaranteed.

1.6.2. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative. All utilities entering Site must be confirmed prior to subsurface disturbance (ie do not rely on as-built documents). As appropriate, confirm locations of buried utilities by independent utility locator and using hand test excavations or hydrovac methods

1.6.3. Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
1.6.4. Maintain and protect from damage all utilities and structures encountered, unless Work involves temporarily breaking, rerouting, or connecting into existing utilities.
1.6.5. Where Work involves temporarily breaking, rerouting, or connecting into existing utilities, obtain permission from utility companies of intended interruption of services, and carry out Work at times determined by the authorities having jurisdiction.
1.6.6. Submit schedule to and obtain approval for any shutdown or closure of active service. Adhere to schedule accepted by Departmental Representative and provide notice to affected parties.
1.6.7. Provide temporary services as required to maintain critical building and tenant systems.
1.6.8. Where unknown utilities are encountered, immediately verbally notify Departmental Representative and confirm findings in writing.

### 1.7. Examination

1.7.1. Examine Site and Contract and be familiar and conversant with existing conditions likely to affect Work, including Contaminated Material.

### 1.8. Records

1.8.1. Land Surveyor to prepare preconstruction as-built Shop Drawings of all utilities.
1.8.2. Land Surveyor to prepare postconstruction as-built Shop Drawings of all utilities, including existing, reinstated, rerouted, and abandoned.
1.8.3. Maintain a complete, accurate log of control and survey work as it progresses.
1.8.4. Preconstruction Condition Survey:
1.8.4.1. Conduct Preconstruction Condition Survey of existing structures and other features which can be affected by Work, both onsite and offsite. Includes: buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, roads, survey bench marks, monuments and other features.
1.8.4.2. Survey to include detailed photographic documentation of any preconstruction damage, and measurements where appropriate, including crack width and length, angles out of true. Record written notices to owners of features that have existing damage.
1.8.4.3. Record written notices of offsite owners which refused entry to conduct Preconstruction Condition Survey.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Waste Reduction Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing material separation. Include:

1.3.1.1. List of materials to be reused or recycled.

1.3.1.2. Sequence, methods and means to dispose Waste offsite. For all Landfill Facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.2. Landfill Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of material delivered to Landfill Facility. Include:

1.3.2.1. Issued by the Landfill Facility.

1.3.2.2. On company letterhead.

1.3.2.3. Name and location of facility where the material is being disposed.

1.3.2.4. Date and weight for each shipment received and total weight received at the Landfill Facility.

1.3.3. Recycling Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of materials sent for recycling.

## 1.4. Waste Disposition

1.4.1. Waste and Non-Contaminated Material Disposal:

1.4.1.1. Dispose all soil and sediment in Landfill Facility.

1.4.1.2. Divert materials other than soil or sediment which can be practically reused or recycled from Landfill as approved by Departmental Representative.

1.4.1.3. All Waste not reused or recycled must be disposed in Landfill Facility..

## 1.5. Waste Transport

1.5.1. Assume ownership of, and be responsible for, Waste once it is loaded on a vehicle, barge, or other vessel for transport.

1.5.2. Transport material as soon as practical. Do not unreasonably stockpile material onsite.

1.5.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.
1.5.4. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
1.5.5. Stabilize material as necessary.
1.5.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Waste.
1.5.7. Barges must be inspected by an independent Marine Surveyor and Submit a copy of the Certificate of Seaworthiness to Departmental Representative.
1.5.8. Manifest and correlate quantities of all material transported from Site documenting quantity removed from Site, movement, transfer stations, interim storage and treatment, and weight of material at final Disposal Facility. Submit all manifests, as directed by the Departmental Representative.
1.5.9. Material transported with discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
1.5.9.1. No manifest or an incomplete manifest.
1.5.9.2. The material transported does not match the description in the manifest.
1.5.9.3. The amount transported differs by more than 5% in the manifest.
1.5.9.4. The material transported is in a hazardous condition.
1.5.10. Transfer/Interim Storage Facility must:
1.5.10.1. Be an existing offsite facility located in Canada or the United States.
1.5.10.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
1.5.10.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the transfer or interim storage of relevant Contaminated Material.
1.5.10.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
1.5.11. Facility Authority:
1.5.11.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
1.5.11.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
1.5.11.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
1.5.11.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

## 1.6. Waste Disposal

1.6.1. Assume ownership of, and be responsible for, Waste disposed.

1.6.2. Waste Disposal: dispose Waste at Landfill Facility provided by Contractor and accepted by the Departmental Representative.
1.6.3. Disposal Facility must:
1.6.3.1. Be an existing offsite facility located in Canada or the United States.
1.6.3.2. Be designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility. Must conform with the BC Landfill Criteria For Municipal Solid Waste or equivalent requirements of authorities having jurisdiction.
1.6.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the disposal of relevant Contaminated Material.
1.6.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
1.6.4. Facility Authority:
1.6.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
1.6.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
1.6.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
1.6.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
1.6.5. Dispose material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
1.6.6. Material sent to a Landfill Facility must be permanently stored at that facility.
1.6.7. If proposed Landfill Facility is not acceptable to Departmental Representative, provide an alternate Landfill Facility that is acceptable.
1.6.8. Submit Landfill Receipts for all Waste material disposed offsite.

## 1.7. Materials Source Separation

1.7.1. Provide separate containers for reusable and/or recyclable Non-Contaminated Materials of the following:
1.7.1.1. Metals.
1.7.1.2. Wood.
1.7.1.3. Plastics.
1.7.1.4. Paper.
1.7.1.5. Glass.
1.7.1.6. Concrete.
1.7.1.7. Other materials in accordance with the Contract.

1.7.2. Implement Materials Source Separation Program for waste generated on project in compliance with methods accepted by the Departmental Representative.
1.7.3. Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
1.7.4. Locate separated materials in areas which minimize material damage.

### 1.8. Diversion of Materials

1.8.1. Create a list of materials to be separated from the general waste stream and stockpiled in separate containers, as accepted by the Departmental Representative and consistent with applicable fire regulations.
1.8.1.1. Mark containers.
1.8.1.2. Provide instruction on disposal practices.

### 1.9. Storage, Handling and Application for Recycling

1.9.1. Do Work in compliance with Waste Reduction Plan.
1.9.2. Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes, and dispose at Recycling Facility weekly.
1.9.3. Materials in separated condition: collect, handle, store onsite, and transport offsite to an authorized recycling facility accepted by the Departmental Representative, and remove from Site weekly.
1.9.4. Materials must be immediately separated into specified categories for reuse or recycling.
1.9.5. Unless otherwise in accordance with the Contract, materials for removal become the Contractor's property.
1.9.6. Onsite sale of salvaged/recyclable material is not permitted.
1.9.7. Submit receiving facility weigh scale receipts indicating quantity and type of materials sent for recycling as directed by the Departmental Representative.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Product Instructions: at least 10 Working Days before Substantial Performance of the Work is completed, Submit instructions and data by personnel experienced in maintenance and operation of products and equipment constructed and remaining onsite, if required.

1.3.2. Closeout Documents: within 20 Working Days of Final Completion of Site Restoration, Submit completion documents and as-built documents.

## 1.4. As-Built Documents

1.4.1. The Departmental Representative will provide 2 sets of Drawings, 2 sets of Specifications, and 2 copies of the original AutoCAD files for “as-built” purposes.

1.4.2. As Work progresses, maintain accurate records to show all deviations from the Contract. Note changes as they occur on as-built Specifications, Drawings and Shop Drawings.

1.4.3. Drawings and Shop Drawings: legibly mark each item to record actual construction, including:

1.4.3.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

1.4.3.2. Field changes of dimension and detail.

1.4.3.3. Changes made by change orders.

1.4.3.4. Details not on original Drawings.

1.4.3.5. References to related Shop Drawings and modifications.

1.4.4. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:

1.4.4.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

1.4.4.2. Changes made by addenda and change orders.

1.4.5. As-built information:

1.4.5.1. Record changes in red ink.

1.4.5.2. Mark on 1 set of Drawings, Specifications and Shop Drawings at Final Completion of project and, before final inspection, neatly transfer notations to second set.

1.4.5.3. Submit 1 set in editable AutoCAD 14 file format with all as-built information.

1.4.5.4. Submit all sets as directed by the Departmental Representative.
1.4.6. As required, surveying to be completed by a Land Surveyor for as-built documents.

### 1.5. Completion Documents

1.5.1. Submit as directed by the Departmental Representative, a written certificate that the following have been performed:
1.5.1.1. Work has been completed and inspected by the Departmental Representative in accordance with the Contract.
1.5.1.2. Treatment and disposal of treatable soils have been completed and disposal of all other soils has been completed.
1.5.1.3. Damage has been repaired, deficiencies have been completed, missing items have been provided, and non-conformance has been corrected, in the opinion of the Departmental Representative.
1.5.1.4. Equipment and systems have been tested, adjusted and balanced, and are fully operational, as applicable.
1.5.1.5. Certificates required by the Fire Commissioner of Canada, and utility companies have been submitted, as applicable.
1.5.1.6. Operation of systems has been demonstrated to the personnel as directed by the Departmental Representative, as applicable.
1.5.1.7. Qualified Professional report documenting backfilling has met all requirements of the Contract.
1.5.1.8. Work is complete and ready for Final Site Inspection.
1.5.2. Defective products will be rejected, regardless of previous inspections. Replace defective products.
1.5.3. Prepare all documentation required as part of any permits or other authorizations obtained or otherwise the responsibility of the Contractor.

## 2. PART 2 - PRODUCTS

### 2.1. Not Used

2.1.1. Not Used.

## 3. PART 3 - EXECUTION

### 3.1. Not Used

3.1.1. Not Used.

**END OF SECTION**

# 1. PART 1 – General

## 1.1. REFERENCES

**1.1.1.** ASTM D746 - 07 Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact ASTM D 698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m $^3$ ).

**1.1.2.** ASTM D1004-94a(2003) Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting

**1.1.3.** ASTM D1505 - 10 Standard Test Method for Density of Plastics by the Density-Gradient Technique

**1.1.4.** ASTM D1603 - 06 Standard Test Method for Carbon Black Content in Olefin Plastics

**1.1.5.** ASTM D4833 - 07 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

**1.1.6.** ASTM D5199 - 11 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

**1.1.7.** ASTM D5596 - 03(2009) Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

**1.1.8.** ASTM D5994 - 10 Standard Test Method for Measuring Core Thickness of Textured Geomembrane

**1.1.9.** ASTM D6693 - 04(2010) Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

## 1.2. DELIVERY, STORAGE AND HANDLING

**1.2.1.** During delivery and storage, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

## 1.3. WASTE MANAGEMENT AND DISPOSAL

**1.3.1.** Remove from site and dispose of packaging materials at appropriate recycling facilities.

# 2. PART 2 - PRODUCTS

## 2.1. MATERIALS

**2.1.1.** See attached material specifications or to meet equivalent material specifications.

# 3. PART 3 - EXECUTION

**3.1.** INSTALLATION

**3.1.1.** Maintain area of installation free of water and snow accumulations.

**3.1.2.** Prepare excessively soft supporting material as directed by PWGSC Representative.

**3.1.3.** Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (eg. fog, dew), nor in presence of high winds.

**3.1.4.** Place and seam panels in accordance with manufacturer's recommendations on graded surface. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.

**3.1.5.** Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

**3.1.6.** Replace damaged, torn or permanently twisted panels to approval of PWGSC Representative. Remove rejected damaged panels from site.

**3.1.7.** Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.

**3.1.8.** Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

**3.1.9.** Make field seam samples in accordance with requirements described in PART 2 on fragment pieces of geo-membrane and test to verify that seaming conditions are adequate.

**3.1.10.** Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.

**3.1.11.** Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

## 3.2. CLEANING

**3.2.1.** Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

## 3.3. PROTECTION

**3.3.1.** Do not permit vehicular traffic directly on membrane

**END OF SECTION**

# 1. PART 1 – General

## 1.1. REFERENCES

**1.1.1.** American Society for Testing and Materials (ASTM)

**1.1.1.1.** ASTM D 698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m $^3$ ).

## 1.2. EXISTING CONDITIONS

**1.2.1.** Refer to included Borehole and test pit logs.

## 1.3. PROTECTION

**1.3.1.** Maintain access roads to prevent accumulation of construction related debris on roads.

## 1.4. PRODUCTS

## 1.5. MATERIALS

**1.5.1.** Assume excavated or graded materials are suitable for re-use as fill, berms and grading work.

## 1.6. EXECUTION

## 1.7. GRADING

**1.7.1.** Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

**1.7.2.** Grade ditches to depth required for maximum run-off

**1.7.3.** Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

**1.7.4.** Compact filled and disturbed areas.

## 1.8. TESTING

**1.8.1.** Submit testing procedure, frequency of tests, testing laboratory as designated by ULC or certified testing personnel to PWGSC Representative for approval.

## 1.9. SURPLUS MATERIAL

**1.9.1.** Remove surplus material and material unsuitable for grading and transport to designated soil spoil area.

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. Measurement Procedures

1.1.1. See 01 11 00.

## 1.2. Definitions

1.2.1. See 01 11 00.

## 1.3. Action and Informational Submittals

1.3.1. Temporary Hoarding and Fencing: at least 5 Working Days prior to installation, Submit a description of temporary hoarding and fencing.

1.3.2. Sloping, Shoring, Excavation and Backfilling Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit documentation describing excavation Work. Include:

1.3.2.1. Excavation temporary slope design.

1.3.2.2. Excavation temporary shoring design.

1.3.2.3. Support of structures design.

1.3.2.4. Sequence, methods and means for excavation dewatering and heave protection.

1.3.2.5. Backfilling requirements. Meet or exceed requirements in accordance with the Contract and any other codes, bylaws, rules and regulations applicable to the performance of the Work. Backfilling requirements includes Imported Backfill and Owner Supplied Backfill.

1.3.2.6. Procedures for excavations adjacent to utilities or other structures if the excavation has the potential to impact utilities or other structures.

1.3.2.7. Monitoring and inspection requirements, including frequency or milestones when a Qualified Professional must inspect Works.

1.3.2.8. Sloping, Shoring, Excavation and Backfilling Plan must be signed and sealed by a Qualified Professional, as required by ground conditions, excavation depth, shoring type, or support type.

1.3.3. Monitoring and Testing Results: within 5 Working Days of sampling, Submit all monitoring and testing results. Include procedures, frequency of sampling, Quality Assurance and Quality Control testing and documentation to be provided. Provide monitoring and testing results, including any assessments performed by a Qualified Professional. Include:

1.3.3.1. Noise monitoring.

1.3.3.2. Vibration monitoring.

1.3.3.3. Imported Backfilled, including geotechnical and environmental quality.

1.3.3.4. Compaction testing results.

1.3.3.5. Contaminated Water Treatment Plant water testing.

1.3.3.6. Environmental analytical results for spill or other environmental testing.

1.3.4. Weigh Scale Certification: at least 5 Working Days prior to use, Submit a copy of the Measurement Canada, Weigh Scale Certification for any onsite or offsite weigh scale used during transportation, treatment or disposal.

1.3.5. Weigh Scale Slips: within 10 Working Days of measurement, Submit all onsite and offsite weigh scale slips for material.

## 2. PART 2 - PRODUCTS

### 2.1. Imported Backfilled

2.1.1. Meet backfill requirements according to Drawings.

2.1.2. Meet appropriate grain size distribution from Aggregate Gradations of the current version of BC Ministry of Transportation and Infrastructure *Standard Specifications for Highway Construction*.

## 3. PART 3 - EXECUTION

### 3.1. Site Review

3.1.1. Ensure that all Works comply with the final sealed design documents as prepared by a Qualified Professional.

3.1.2. Qualified Professional to visit Site regularly.

### 3.2. Install Temporary Hoarding

3.2.1. Place temporary hoarding and fencing according to Drawings or as otherwise required so as to provide a visual, environmental, and safety barrier between the Site and neighbouring properties.

3.2.2. Temporary hoarding and fencing to be a minimum of 2.4 m in height.

3.2.3. Temporary hoarding and fencing not to extend beyond the project Site boundary in accordance with the Contract.

3.2.4. Remove and replace temporary hoarding and fencing during excavation activities where excavation along the project Site boundary cannot be accomplished while the temporary hoarding is in place.

3.2.5. The type of temporary hoarding and fencing used will be as selected by the Contractor, but will be subject to approval be Departmental Representative. The temporary hoarding must not have visible holes and must be a neutral color subject to acceptance by Departmental Representative. Only signage accepted by the Departmental Representative will be allowed. No advertising, company identifications, or other markings permitted.

3.2.6. Remove temporary hoarding and fencing from the Site during the Site Restoration.

### 3.3. Design, Construction and Operation of Onsite Access Road(s)

3.3.1. Construct, operate and maintain the onsite access road(s) as required.

3.3.2. Design of temporary onsite access roads to be signed and sealed by a Qualified Professional.
3.3.3. Qualified Professional to confirm that the temporary onsite access roads allow for the safe transport of materials and equipment.
3.3.4. Construction of the onsite access road(s) may require the removal of historic infrastructure.
3.3.5. Any temporary access, detour and haul roads associated with the project must be constructed to accommodate all required uses and be maintained throughout the course of construction operations in a safe, environmentally sound manner.
3.3.6. Location, alignment, design and construction of all detour, access and haul road(s) subject to the acceptance of the Departmental Representative.
3.3.7. Employ suitable measures to maintain quality, visibility, and safe conditions in the use of access, detour and haul road(s) associated with the Work.

### 3.4. Temporary Sloping and Shoring

3.4.1. Determine appropriate sloping or shoring to allow excavation of Contaminated Material Extents according to Drawings or as directed by Departmental Representative.
3.4.2. Design Requirements:
3.4.2.1. Act as sloping or shoring structures for excavations as well as for stability of foundations and infrastructure during remediation/construction excavation procedures.
3.4.2.2. Allow excavation of all Contaminated Material laterally and vertically on the Site to Contaminated Material Extents in accordance with the Contract. Allow excavation of additional Contaminated Material beyond Contaminated Material Extents in order to result in no residual contamination at the Site based on field observations or Confirmation Samples.
3.4.2.3. Provide a safe working environment for personnel and equipment within the dewatered excavation area.
3.4.2.4. Additional sloping or shoring may be required to extend excavation beyond Contaminated Material Extents according to Drawings. Revise Temporary Sloping and Shoring design as required by Qualified Professional.
3.4.2.5. Temporary shoring cannot have any tiebacks or supports which extend beyond the project Site boundary.
3.4.2.6. Temporary shoring must not flex or bend when exposed while excavations are occurring on the Site.
3.4.2.7. Sloping and shoring structures are temporary structures only. Resistance to seismic loads will be at the discretion of the Qualified Professional.
3.4.2.8. Be responsible for any failures and resultant costs should the temporary sloping or shoring fail due to a seismic event during the construction period.
3.4.2.9. All Shop Drawings of sloping and shoring design to be signed and sealed by a Qualified Professional.
3.4.2.10. Temporary sloping and shoring designs to be completed in accordance with methods in current version of Canadian Foundation Engineering Manual.

3.4.3. Installation:
3.4.3.1. All installation activities must take place on the Site. No staging or construction activities are to take place on adjacent properties.
3.4.3.2. Installation must be regularly inspected by a Qualified Professional.
3.4.4. Maintain side slopes of excavations in safe condition by appropriate methods and in accordance with relevant regulations.
3.4.5. During backfill operation:
3.4.5.1. Unless otherwise indicated or as directed by the Departmental Representative, remove temporary shoring from excavations.
3.4.5.2. Do not remove support until backfilling has reached respective levels of such bracing.
3.4.5.3. Remove support in increments that ensure compacted backfill is maintained at elevation at least 500 mm above toe of support.
3.4.6. Temporary sloping and shoring excavated material:
3.4.6.1. Material excavated for sloping or shoring may be re-used as backfill to replace material removed as accepted by Qualified Professional and Departmental Representative.
3.4.6.2. Material excavated for sloping or shoring that is accepted for backfilling must follow procedures in accordance with requirements of Qualified Professional and meet Contract Documents.
3.4.6.3. Material excavated for sloping or shoring not accepted must be removed from Site at Contractor's expense.

## 3.5. Dewatering and Heave Protection

3.5.1. Keep excavations free of water while Work is in progress.
3.5.2. Provide to Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
3.5.3. Plan for excavation below groundwater table to avoid quick conditions or heave.
3.5.4. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
3.5.5. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
3.5.6. Keep excavations, staging pads, and other Work areas free from water including standby equipment necessary to ensure continuous operation of dewatering system.
3.5.7. Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
3.5.8. Separate Contaminated Water from Non-Contaminated Water and collect and divert to Contaminated Water Treatment Plant as required.

## 3.6. Excavation

3.6.1. Notify Departmental Representative at least 5 Working Days in advance of excavation operations.
3.6.2. Excavate to lines, grades, elevations and dimensions according to Drawings or as directed by Departmental Representative.
3.6.3. Excavate all Contaminated Material laterally and vertically on the Site to Contaminated Material Extents in accordance with the Contract. Excavate additional Contaminated Material beyond Contaminated Material Extents in order to result in no residual contamination at the Site based on field observations or Confirmation Samples
3.6.4. Excavation must not interfere with bearing capacity of adjacent foundations and infrastructure.
3.6.5. Machine cut banks and slopes.
3.6.6. Protect bottom of excavations from excessive traffic.
3.6.7. Grade excavation top perimeter to prevent surface water run-off into excavation.
3.6.8. Keep excavated and stockpiled materials safe distance away from edge of excavation.
3.6.9. Restrict vehicle operations directly adjacent to open excavations.
3.6.10. Segregate and handle to minimize the amount of Hazardous Waste materials wherever possible, while complying with Hazardous Waste disposal regulations. Segregation of Hazardous Waste during excavation will be by visual and olfactory characteristics and available in-situ characterization.
3.6.11. Contaminated Material onsite classification will be based on available in-situ characterization or ex-situ characterization as directed by Departmental Representative.
3.6.12. Non-Contaminated Material onsite classification will be based on available in-situ characterization or ex-situ characterization as directed by Departmental Representative.
3.6.13. Remove Waste Oversize Debris. Break or cut oversize debris into manageable size.
3.6.13.1. Piles encountered during excavation must be cut off at base of excavation. Piles are not to be extracted beyond the base of the excavation.
3.6.13.2. Debris that impinges on infrastructure or neighbouring properties is not to be removed unless directed by Departmental Representative. Qualified Professional to confirm debris can be removed without impacting infrastructure or neighbouring properties.
3.6.14. Remove Non-Contaminated Material to Landfill or re-use as Owner Supplied Backfill according to Drawings and as directed by Departmental Representative.
3.6.15. Remove Contaminated Material to onsite Treatment Facility or offsite Treatment Facility or offsite Disposal Facility.
3.6.16. Earth bottoms of excavations to be undisturbed soil or sediment, level, free from loose, soft or organic material.
3.6.17. Notify Departmental Representative when bottom of excavation is reached based on Contaminated Material Extents.

3.6.18. Provide assistance for collection of Confirmation Samples as directed to the Departmental Representative.
3.6.19. Obtain acceptance by Departmental Representative of completed excavation.

### 3.7. Backfill Types and Compaction

3.7.1. Use only Imported Backfill, Overburden Backfill, or Owner Supplied Backfill in accordance with the Contract and which has been recommended by a Qualified Professional, and previously accepted as a Submittal.
3.7.2. Compact material in accordance with the Contract to ensure no long term settlement and is suitable for planned post-remediation use:
3.7.2.1. Compact each layer of material to the more stringent of Excavation Plan or Drawings.
3.7.2.2. Machine compact all fill materials unless otherwise according to Drawings.

### 3.8. Backfilling

3.8.1. Do not proceed with backfilling operations until completion of following:
3.8.1.1. Confirmation Samples collection, analysis, and assessment has been completed by the Departmental Representative. Confirmation Samples analysis and assessment may take up to 5 Working Days. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Samples results provided within 5 Working Days, not including day of sample collection.
3.8.1.2. Surveying has been completed by a Land Surveyor for as-built documents
3.8.1.3. Departmental Representative has inspected and excavation limits accepted by the Departmental Representative based on survey data and Confirmation Samples results.
3.8.1.4. Departmental Representative has inspected and accepted backfill material.
3.8.1.5. Proposed backfill material can be sampled and tested for geotechnical and environmental quality. Backfill material testing may take up to 5 Working Days not including day of sample collection.
3.8.1.6. Departmental Representative has inspected and accepted compaction results for previous lift.
3.8.1.7. Removal of shoring and bracing; backfilling of voids with satisfactory backfill material.
3.8.2. Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
3.8.3. Do not use backfill material which is frozen or contains ice, snow or debris.
3.8.4. Place backfill material in uniform layers in accordance with the Contract. Compact each layer to the satisfaction of the Qualified Professional and in accordance with the Contract before placing succeeding layer.
3.8.5. Backfill compaction to be tested by a Qualified Professional in accordance with Excavation Plan.
3.8.6. Notify Departmental Representative when final backfill grade is reached.

3.8.7. Do not begin subsequent Work until surveying has been completed by the Departmental Representative for documentation.

### 3.9. Overburden and Owner Supplied Material Backfilling

3.9.1. Place in locations in excavation as directed by Departmental Representative.

3.9.2. Be responsible for compacting to the satisfaction of the Qualified Professional and in accordance with the Contract.

3.9.2.1. Collect and test samples as required by the Qualified Professional prior to placement.

3.9.2.2. Identify any geotechnical concerns prior, and obtain Departmental Representative approval to proceed, prior to placement.

**END OF SECTION**

## 4. PART 1 – General

### 4.1. REFERENCES

**4.1.1.** ASTM D746 - 07 Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact ASTM D 698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m $^3$ ).

**4.1.2.** ASTM D1004-94a(2003) Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting

**4.1.3.** ASTM D1505 - 10 Standard Test Method for Density of Plastics by the Density-Gradient Technique

**4.1.4.** ASTM D1603 - 06 Standard Test Method for Carbon Black Content in Olefin Plastics

**4.1.5.** ASTM D4833 - 07 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

**4.1.6.** ASTM D5199 - 11 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

**4.1.7.** ASTM D5596 - 03(2009) Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

**4.1.8.** ASTM D5994 - 10 Standard Test Method for Measuring Core Thickness of Textured Geomembrane

**4.1.9.** ASTM D6693 - 04(2010) Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

### 4.2. DELIVERY, STORAGE AND HANDLING

**4.2.1.** During delivery and storage, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

### 4.3. WASTE MANAGEMENT AND DISPOSAL

**4.3.1.** Remove from site and dispose of packaging materials at appropriate recycling facilities.

## 5. PART 2 - PRODUCTS

### 5.1. MATERIALS

**5.1.1.** See attached material specifications or meet equivalent material specifications.

## 6. PART 3 - EXECUTION

**6.1.** INSTALLATION

**6.1.1.** Maintain area of installation free of water and snow accumulations.

**6.1.2.** Prepare excessively soft supporting material as directed by PWGSC Representative.

**6.1.3.** Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (eg. fog, dew), nor in presence of high winds.

**6.1.4.** Place and seam panels in accordance with manufacturer's recommendations on graded surface. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.

**6.1.5.** Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

**6.1.6.** Replace damaged, torn or permanently twisted panels to approval of PWGSC Representative. Remove rejected damaged panels from site.

**6.1.7.** Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.

**6.1.8.** Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

**6.1.9.** Make field seam samples in accordance with requirements described in PART 2 on fragment pieces of geo-membrane and test to verify that seaming conditions are adequate.

**6.1.10.** Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.

**6.1.11.** Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

## 6.2. CLEANING

**6.2.1.** Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

## 6.3. PROTECTION

**6.3.1.** Do not permit vehicular traffic directly on membrane

**END OF SECTION**

# 1. PART 1 - GENERAL

## 1.1. REFERENCES

**1.1.1.** American Society for Testing and Materials (ASTM).

**1.1.1.1.** ASTM C 117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

**1.1.1.2.** ASTM C 131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

**1.1.1.3.** ASTM C 136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

**1.1.1.4.** ASTM D 422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.

**1.1.1.5.** ASTM D 698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).

**1.1.1.6.** ASTM D 1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).

**1.1.1.7.** ASTM D 1883-07e1, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

**1.1.1.8.** ASTM D 4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

## 1.2. WASTE MANAGEMENT AND DISPOSAL

1.2.1. Transport unused granular material to an appropriate off-site facility for disposal.

# 2. PART 2 - PRODUCTS

## 2.1. MATERIALS

**2.1.1.** Granular sub-base material: in accordance with Section 31 05 16 - Aggregate Materials and following requirements

**2.1.1.1.** Sample and provide representative grain size analysis (wash analysis) and fracture count test results for proposed 19.5 mm crush product, allow PWGSC representative 3 business days to review and approve for use prior to placing product.

# 3. PART 3 – EXECUTION

## 3.1. PLACING

**3.1.1.** Place granular sub-base after subgrade is inspected and approved by PWGSC Representative.

**3.1.2.** Construct granular sub-base to depth and grade in areas indicated.
**3.1.3.** Ensure no frozen material is placed.
**3.1.4.** Place material only on clean unfrozen surface, free from snow or ice.
**3.1.5.** Begin spreading sub-base material on crown line or high side of one-way slope.
**3.1.6.** Place granular sub-base materials using methods which do not lead to segregation or degradation.
**3.1.7.** Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
**3.1.8.** Remove and replace portion of layer in which material has become segregated during spreading.

## 3.2. COMPACTION

**3.2.1.** Compaction equipment to be capable of obtaining required material densities.
**3.2.2.** Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
**3.2.3.** Apply water as necessary during compaction to obtain specified density.
**3.2.4.** In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by PWGSC Representative.
**3.2.5.** Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

## 3.3. PROTECTION

**3.3.1.** Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by PWGSC Representative.

**END OF SECTION**

# APPENDIX A

# Site Photographs

Keystone Environmental

# PHOTOGRAPHIC LOG

| Client Name: Public Works and Government Services Canada | Site Location: AEC 8 Watson Lake Airport, Yukon Territory | Project No. 13118 |
|---|---|---|

## Photo No. 1

**Date: August 23, 2016**

**Direction Photo taken: Northwest**

**Description: Proposed area of the landfill cap and adjacent airport access road. Please note presence of stick up casing for monitoring well (orange) left of photo center.**
**See Drawing 2 for location of that the photo was taken.**

| Client Name: Public Works and Government Services Canada | Site Location: AEC 8 Watson Lake Airport, Yukon Territory | Project No. 13118 |
|---|---|---|

## Photo No. 2

**Date: August 23, 2016**

**Direction Photo taken: Southwest**

**Description: Proposed area of the landfill cap**

| Client Name: Public Works and Government Services Canada | Site Location: AEC 8 Watson Lake Airport, Yukon Territory | Project No. 13118 |
|---|---|---|

## Photo No. 3

**Date: August 23, 2016**

**Direction Photo taken: South**

**Description: Proposed area of the landfill cap and to photo right, adjacent airport access road. Please note presence of stick up casings for monitoring wells (orange) photo center and right.**

| Client Name: Public Works and Government Services Canada | Site Location: AEC 8 Watson Lake Airport, Yukon Territory | Project No. 13118 |
|---|---|---|

## Photo No. 4

**Date: August 23, 2016**

**Direction Photo taken: Southeast**

**Description: Proposed area of the landfill cap**

# APPENDIX B

# Environmental Investigations
## (Test Pit and Borehole Logs)

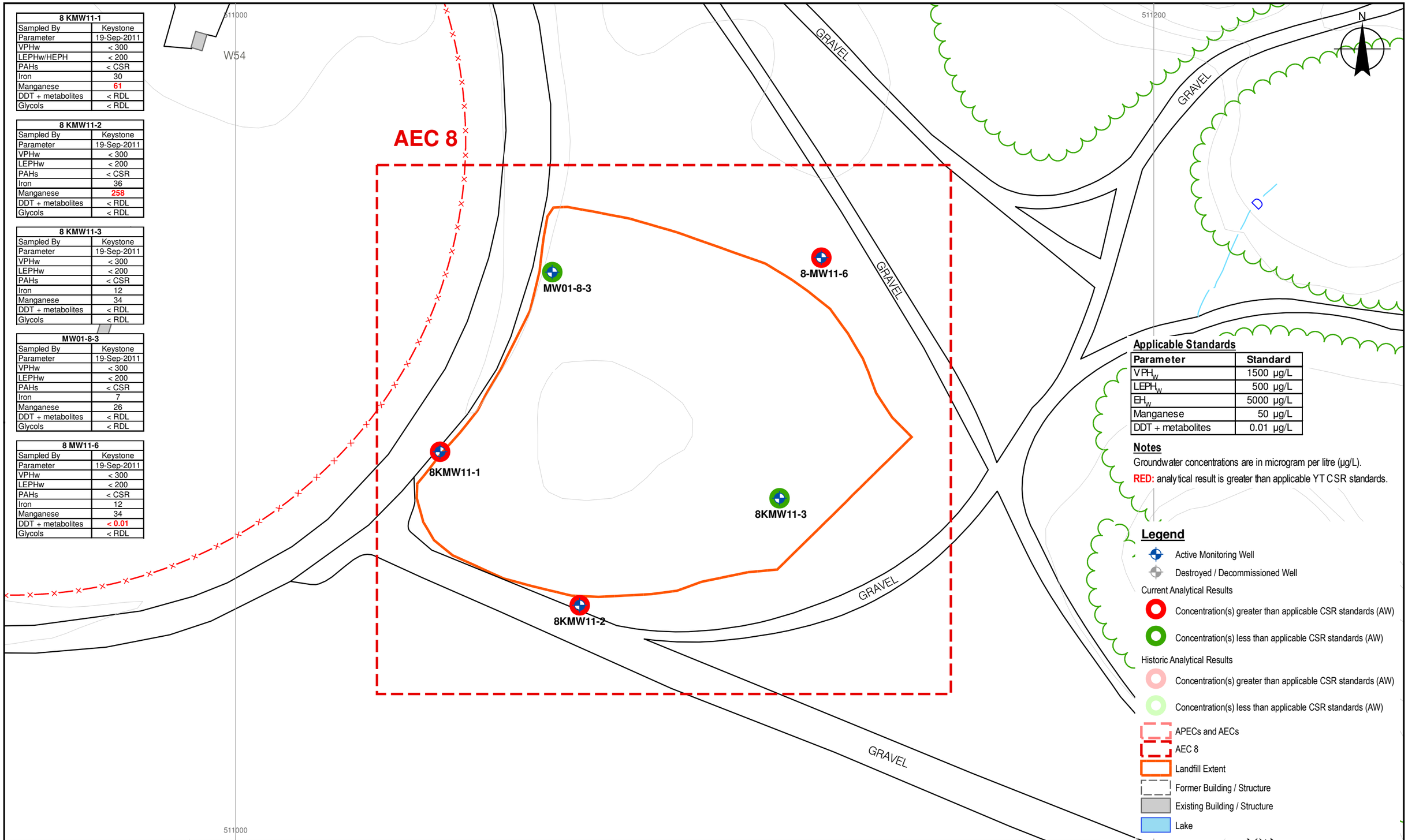
| 8 KMW11-1 | |
|---|---|
| Sampled By | Keystone |
| Parameter | 19-Sep-2011 |
| VPHw | < 300 |
| LEPHw/HEPH | < 200 |
| PAHs | < CSR |
| Iron | 30 |
| Manganese | 61 |
| DDT + metabolites | < RDL |
| Glycols | < RDL |

| 8 KMW11-2 | |
|---|---|
| Sampled By | Keystone |
| Parameter | 19-Sep-2011 |
| VPHw | < 300 |
| LEPHw | < 200 |
| PAHs | < CSR |
| Iron | 36 |
| Manganese | 258 |
| DDT + metabolites | < RDL |
| Glycols | < RDL |

| 8 KMW11-3 | |
|---|---|
| Sampled By | Keystone |
| Parameter | 19-Sep-2011 |
| VPHw | < 300 |
| LEPHw | < 200 |
| PAHs | < CSR |
| Iron | 12 |
| Manganese | 34 |
| DDT + metabolites | < RDL |
| Glycols | < RDL |

| MW01-8-3 | |
|---|---|
| Sampled By | Keystone |
| Parameter | 19-Sep-2011 |
| VPHw | < 300 |
| LEPHw | < 200 |
| PAHs | < CSR |
| Iron | 7 |
| Manganese | 26 |
| DDT + metabolites | < RDL |
| Glycols | < RDL |

| 8 MW11-6 | |
|---|---|
| Sampled By | Keystone |
| Parameter | 19-Sep-2011 |
| VPHw | < 300 |
| LEPHw | < 200 |
| PAHs | < CSR |
| Iron | 12 |
| Manganese | 34 |
| DDT + metabolites | < 0.01 |
| Glycols | < RDL |




**Applicable Standards**

| Parameter | Standard |
|---|---|
| $VPH_W$ | 1500 µg/L |
| $LEPH_W$ | 500 µg/L |
| $EH_W$ | 5000 µg/L |
| Manganese | 50 µg/L |
| DDT + metabolites | 0.01 µg/L |

**Notes**

Groundwater concentrations are in microgram per litre (µg/L).

**RED:** analytical result is greater than applicable YT CSR standards.

**Legend**

- Active Monitoring Well
- Destroyed / Decommissioned Well

Current Analytical Results

- Concentration(s) greater than applicable CSR standards (AW)
- Concentration(s) less than applicable CSR standards (AW)

Historic Analytical Results

- Concentration(s) greater than applicable CSR standards (AW)
- Concentration(s) less than applicable CSR standards (AW)
- APECs and AECs
- AEC 8
- Landfill Extent
- Former Building / Structure
- Existing Building / Structure
- Lake

Keystone Environmental

*NOTE: THIS DRAWING IS FOR GENERAL INFORMATION ONLY. LOT BOUNDARIES AND FEATURES ARE APPROXIMATE.*

7.5 0 67.5 m

SCALE: 1:750

Watson Lake Airport, Yukon
Public Works and
Government Services Canada

| REVISION No. | DATE | PROJECT No. |
|---|---|---|
| 00 | February 28, 2012 | 11113 - 06 |

**Figure 17**
Groundwater Analytical Results
2011 (AEC 8)

DRAWN BY: RC PDF FILE NO. I:\11100-11199\11113 - Whitehorse and Watson Lake GW\Figs\GIS\maps\Watson Lake\Fig14-GW Analytical Results-BG-R0.mxd

# MONITORING WELL ID: 8KMW11-1

Keystone Environmental

**Project Location:** Watson Lake Airport, Yukon
**Project Name/No.:** Watston Lake Airport AEC 8
**Drilling Contractor:** Uniwide Drilling Company Ltd.
**Client:** PWGSC
**Drilling Equipment/Method:** Solid and Hollow Stem Augers
**Engineer/Geologist:** WBL
**Well Location:** NW Corner of AEC 8 Landfill
**Drill Date:** September 14, 2011 **Page:** 1 of 1

| Depth (ft/m) | Symbol | Soil / Sediment Description | Sample Type | % Recovery | Sample Analyzed (Y,N) | Sample ID | Headspace (GasTech) ppm 0 100 300 500 | Headspace (GasTech) LEL in % 0 20 60 100 | Well Construction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| ft -2, -1, 0 / m | | Ground Surface | | | | | | | Stick Up Cover | |
| 0–9 / 0–3 | | ***SAND*** Tan ,fine to medium SAND with trace gravel. Damp, loose, plasticity and odours and staining were not observed. | | | | | | | Bentonite Seal | |
| 9–11 / 3 | | ***SAND*** Tan very fine to fine SAND, Moist, loose, no plasticity and odours and staining were not observed. | | | | | | | Water Level | |
| 11–15 / 4 | | ***SAND*** Tan fine to coarse grained SAND with trace fine gravel. Wet at 4.0 mbg, loose, no plasticity and odours and staining were not observed. | | | | | | | Well Screen and Filter Sand Pack | |
| 15–25 / 5–7 | | ***SAND*** Tan to grey fine SAND, wet, loose, no plasticity and odours and stainng were not observed. | | | | | | | Native Slough | |
| 25–27 / 8 | | End of Hole | | | | | | | | |

Date of Water Level: September 16, 2011
Water Level (from TOC): 3.89 m

Well-Borehole Diameter: 22 cm
Well Casing Diameter: 5 cm
Well Casing Material: PVC
Well Screen Slot Size: 10

Depth of Well (TOC): 6.145 m

# MONITORING WELL ID: 8KMW11-2

Keystone Environmental

**Project Location:** Watson Lake Airport, Yukon
**Project Name/No.:** Watston Lake Airport AEC 8
**Drilling Contractor:** Uniwide Drilling Company Ltd.
**Client:** PWGSC
**Drilling Equipment/Method:** Solid and Hollow Stem Augers
**Engineer/Geologist:** WBL
**Well Location:** SW Corner of AEC 8 Landfill
**Drill Date:** September 14, 2011 **Page:** 1 of 1

| Depth (ft/m) | Symbol | Soil / Sediment Description | Sample Type | % Recovery | Sample Analyzed (Y,N) | Sample ID | Headspace (GasTech) ppm 0 100 300 500 | Headspace (GasTech) LEL in % 0 20 60 100 | Well Construction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| ft m | | Ground Surface | | | | | | | Stick Up Cover | |
| 0 | | ***SAND and GRAVEL*** Light brown, medium to coarse SAND and GRAVEL. Damp, loose to denser with depth. No plasticity and odours and staining were not observed. | | | | | | | Bentonite Seal | |
| 4 | | ***SAND*** Tan, fine to medium SAND with minor coarse sand. Damp to moist, loose, no plasticity and odours and staining were not observed. Trace gravel from 5.2 to 5.5 m and at 6.0 mbg. | | | | | | | Water Level; Well Screen and Filter Sand Pack | |
| 20 | | End of Hole | | | | | | | | |

Date of Water Level: September 16, 2011
Water Level (from TOC): 5.96 m

Well-Borehole Diameter: 22 cm
Well Casing Diameter: 5 cm
Well Casing Material: PVC
Well Screen Slot Size: 10

Depth of Well (TOC): 6.95 m

# MONITORING WELL ID: 8KMW11-3

Keystone Environmental

**Project Location:** Watson Lake Airport, Yukon
**Project Name/No.:** Watston Lake Airport AEC 4
**Drilling Contractor:** Uniwide Drilling Company Ltd.
**Client:** PWGSC
**Drilling Equipment/Method:** Solid and Hollow Stem Augers
**Engineer/Geologist:** WBL
**Well Location:** South of Center of AEC 8 Landfill
**Drill Date:** September 14, 2011 **Page:** 1 of 1

| Depth (ft/m) | Symbol | Soil / Sediment Description | Sample Type | % Recovery | Sample Analyzed (Y,N) | Sample ID | Headspace (GasTech) ppm 0 100 300 500 | Headspace (GasTech) LEL in % 0 20 60 100 | Well Construction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| ft m | | Ground Surface | | | | | | | Stick Up Cover | |
| 0 | | ***SAND and GRAVEL*** Tan , medium to coarse SAND and GRAVEL. Moist, loose, no fines, no plasticity and odours and staining were not observed. | | | | | | | Bentonite Seal | |
| 1 m | | | | | | | | | | |
| 2 m | | | | | | | | | | |
| 3 m | | | | | | | | | | |
| 4 m | | | | | | | | | | |
| 5 m | | ***SAND*** Tan, fine SAND with trace gravel. Moist then wet @ 4.7 mbg. Loose, no plasticity and odours and staining were not observed. | | | | | | | Water Level | |
| 6 m | | | | | | | | | Well Screen and Filter Sand Pack | |
| 20 | | End of Hole | | | | | | | | |

Date of Water Level: September 16, 2011
Water Level (from TOC): 6.84 m

Well-Borehole Diameter: 22 cm
Well Casing Diameter: 5 cm
Well Casing Material: PVC
Well Screen Slot Size: 10

Depth of Well (TOC): 5.92 m

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# BOREHOLE LOG

Borehole No: BH01-8-1 Page 1 of 1
Reference Level : _____

Project: Watson Lake – Phase III Site Assessment  Client: PWGSC
Location: Watson Lake  Project No.: 639-0101
Drilling Date: Sept. 12, 2001  Depth of Borehole: 6.1 m  Diameter: 25 cm
Surface Elevation: 685.60 masl  TOC: 686.47 masl  Water Level: 681.06 masl
Screen Diameter: 25 cm  Length: 2.74 m  Slot size: #10 slot
Riser Diameter: 5 cm  Length: 0.87 m  Type: Sch 40 PVC
Drilling Company: Geotech Drilling Services Ltd.  Drilling Method: Hollow Stem Auger
Logged by: Clayton Truax

*Site Plan*

refer to APEC #8 figure

***Notes***
* Indicates sample sent to lab.

| Elevation (masl) | Depth (m) | Stratigraphy | SOIL CLASSIFICATION (colour, texture, structure) | Sample No. | Sample Type (split spoon) | Recovery (%) | "N" | V.O.C. (110 ppm) | Well Data | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 000.00 | 0 | | dark brown loam, root zone | 1 | SS | 75% | 3,6,8,11 | 60 ppm | above ground protective casing | |
| | 1 | | | 2 | SS | 71% | 5,6,6,6 | 70 ppm | concrete<br>bentonite | |
| | 2 | | coarse light brown sand with gravel and occasional coble, dry | 3 | SS | 71% | 5,5,5,7 | 95 ppm | silicate sand | |
| | 3 | | | 4 | SS | 67% | 3,3,2,4 | 110 ppm | | |
| | 4 | | | 5 | SS | 83% | 3,3,4,5 | 65 ppm | | |
| | 5 | | coarse light brown sand with gravel and occasional cobble, wet | 6 | SS | 71% | 3,5,5,4 | 60 ppm | | |
| | 6 | | | 7 | SS | 54% | 1,2,3,3 | – | | |
| | 7 | | | 8 | SS | – | – | 65 ppm | | |
| | 8 | | | | | | | | end of hole | |
| | 9 | | | | | | | | | |
| | 10 | | | | | | | | | |

Note: This borehole log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of subsurface conditions. Borehole data require interpretation by Franz Environmental Inc. personnel before use by others.

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# BOREHOLE LOG

Borehole No: BH01-8-2 Page 1 of 1
Reference Level : _____

Project: Watson Lake – Phase III Site Assessment  Client: PWGSC
Location: Watson Lake  Project No.: 639-0101
Drilling Date: Sept. 12, 2001  Depth of Borehole: 5.36 m  Diameter: 25 cm
Surface Elevation: 685.12 masl  TOC: 685.80 masl  Water Level: 681.14 masl
Screen Diameter: 5 cm  Length: 2.74 m  Slot size: #10 slot
Riser Diameter: 5 cm  Length: 0.68 m  Type: Sch 40 PVC
Drilling Company: Geotech Drilling Services Ltd.  Drilling Method: Hollow Stem Auger
Logged by: Clayton Truax

*Site Plan*

refer to APEC #8 figure

***Notes***
* Indicates sample sent to lab.

| Elevation (masl) | Depth (m) | Stratigraphy | SOIL CLASSIFICATION (colour, texture, structure) | Sample No. | Sample Type ss (split spoon) | Recovery (%) | "N" | V.O.C. (110 ppm) | Well Data | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 000.00 | 0 | | brown medium coarse sand with pebbles, in root zone, minor coal bits | 1 | SS | 12.5% | 2,2,2,3 | – | | above ground protective casing |
| | 1 | | | 2 | SS | 37.5% | 1,1,1,3 | – | | concrete |
| | 2 | | dark brown coarse sand with cobbles, moist, no odour or staining | 3 | SS | 37.5% | 1,1,1,2 | – | | silicate sand |
| | 3 | | | 4 | SS | 45.8% | 1,2,2,2 | 60 ppm | | bentonite |
| | 4 | | dark brown coarse sand with small rounded gravel and some fines, wet, no odour or staining | 5 | SS | – | 2,4,6,6 | – | | silicate sand |
| | 5 | | | 6 | SS | 50% | 3,3,3,3 | 65 ppm | | |
| | 6 | | | 7 | SS | 92% | 3,1,2,3 | 60 ppm | | end of hole |
| | 7 | | | | | | | | | |
| | 8 | | | | | | | | | |
| | 9 | | | | | | | | | |
| | 10 | | | | | | | | | |



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# BOREHOLE LOG

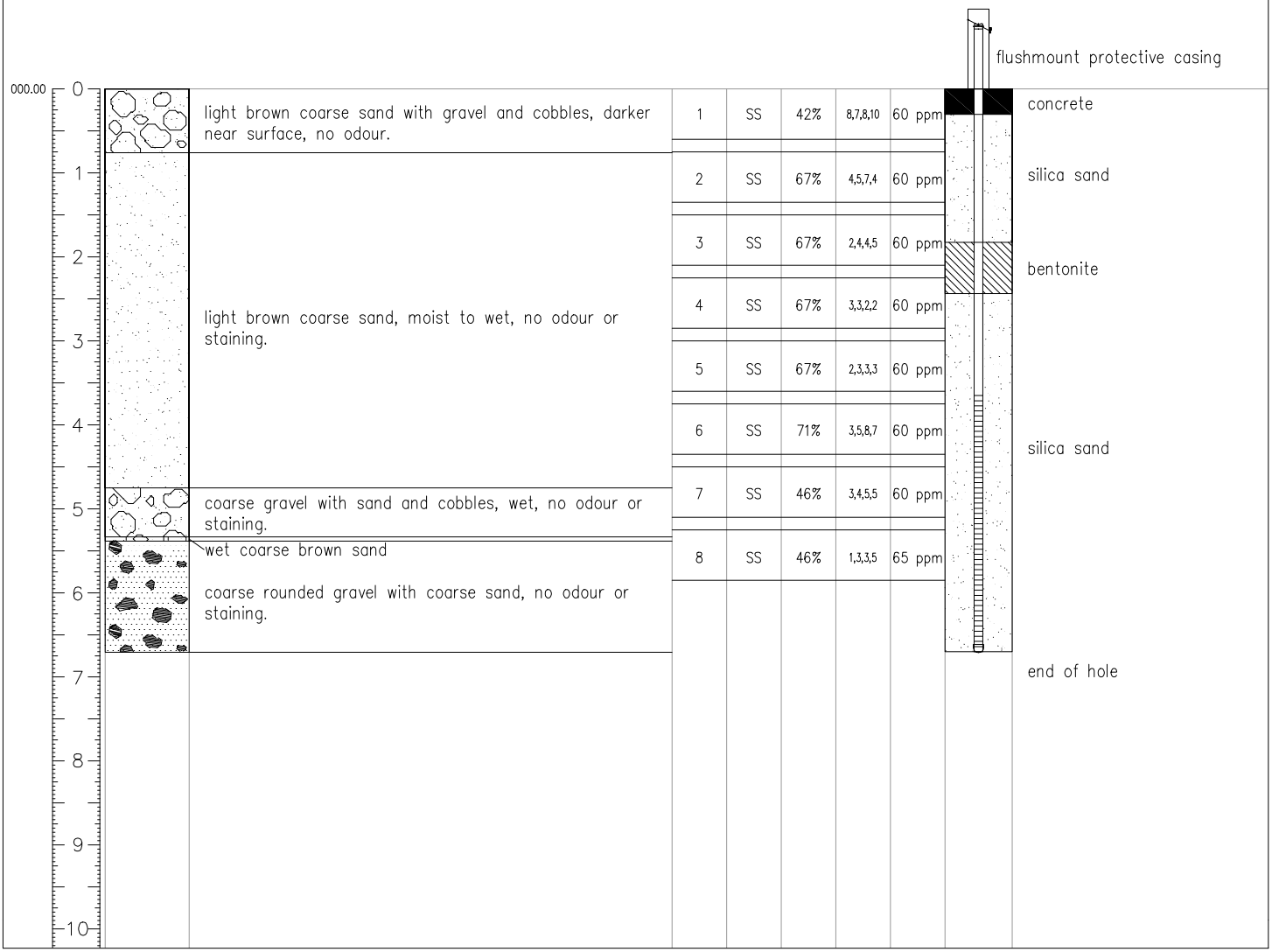
Borehole No: BH01-8-3 Page 1 of 1
Reference Level : _____

Project: Watson Lake – Phase III Site Assessment  Client: PWGSC
Location: Watson Lake  Project No.: 639-0101
Drilling Date: Sept. 12, 2001  Depth of Borehole: 6.7 m  Diameter: 25 cm
Surface Elevation: 686.01 masl  TOC: 686.75 masl  Water Level: 681.19 masl
Screen Diameter: 5 cm  Length: 2.74 m  Slot size: #10 slot
Riser Diameter: 5 cm  Length: 0.74 m  Type: Sch 40 PVC
Drilling Company: Geotech Drilling Services Inc.  Drilling Method: Hollow Stem Auger
Logged by: Clayton Truax

*Site Plan*

refer to APEC #8 figure

***Notes***
* Indicates sample sent to lab.




| Elevation (masl) | Depth (m) | Stratigraphy | SOIL CLASSIFICATION (colour, texture, structure) | Sample No. | Sample Type ss (split spoon) | Recovery (%) | "N" | V.O.C. (110 ppm) | Well Data | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | SS | 42% | 8,7,8,10 | 60 ppm | | |
| | | | | 2 | SS | 67% | 4,5,7,4 | 60 ppm | | |
| | | | | 3 | SS | 67% | 2,4,4,5 | 60 ppm | | |
| | | | | 4 | SS | 67% | 3,3,2,2 | 60 ppm | | |
| | | | | 5 | SS | 67% | 2,3,3,3 | 60 ppm | | |
| | | | | 6 | SS | 71% | 3,5,8,7 | 60 ppm | | |
| | | | | 7 | SS | 46% | 3,4,5,5 | 60 ppm | | |
| | | | | 8 | SS | 46% | 1,3,3,5 | 65 ppm | | |

Note: This borehole log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of subsurface conditions. Borehole data require interpretation by Franz Environmental Inc. personnel before use by others.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**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT 1

**Total Depth:** 1.4 m

**Ground Surface Elevation:** n/a

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-1*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Head Space Vapour Readings | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***TOPSOIL***<br>Dark brown silty sand with some organics, roots | 0.25 | | | | Some minor surficial metal debris:<br>- barrel, steel cable. |
| 1 | | ***SAND(1)***<br>Brown coarse Sand with some small pebbles.<br>-dry, compact<br>-no hydrocarbon odours, no staining | 0.55 | | | | |
| 2 | | ***SAND(2)***<br>Grey medium to coarse Sand with trace small pebbles<br>-damp, compact<br>-no hydrocarbon odours, no staining<br>-NATIVE SOIL | | | 01TP08-1A-1.0 | 0 | Water table not encountered |
| 3 / 1 | | | | | | | |
| 4 | | | 1.4 | | | | |
| | | End of Test-Pit | | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

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Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT 2

**Total Depth:** 1.4

**Ground Surface Elevation:** n/a

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-2*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahemd Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Head Space Vapour Readings | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***TOPSOIL***<br>Brown silty sand with some organics, roots<br>-dry, loose<br>-no hydrocarbon odour | 0.25 | | | | Some minor surficial metal debris |
| 1 | | ***SAND(1)***<br>Light brown coarse Sand, with some cobbles<br>-dry, compact<br>-no hydrocarbon odour, no staining | 0.55 | | | | Orange/brown staining noted in Sand between 0.8 m and 1.0 m depths. |
| 2 | | ***SAND(2)***<br>Grey coarse Sand with trace small pebbles, cobbles.<br>damp, compact<br>-no hydrocarbon odours<br>-NATIVE SOIL | | | 01TP08-2A-1.0 | 0 | Sample 01TP08-2-1.0 is taken outside of zone of orange/brown staining. |
| 3 / 1 | | | | | | | Water table not encountered. |
| 4 | | | 1.4 | | | | |
| | | End of Test-Pit | | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

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**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT 3

**Total Depth:** 1.7 m

**Ground Surface Elevation:** 684.80 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-3*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Headspace Vapour (ppm) | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***SAND and COBBLES*** Brown Sand and Cobbles with some coal flecks and chunks of black peat. -dry, loose - no hydrocarbon odour | 685 | | 01TP08-3-1.0 | 0 | Center of dump reportedly containing metal debris located 16 m E of this test-pit. |
| 1 / | | | 1.7 | | | | Water table not encountered. |
| | | End of Test-Pit | 683 | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

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**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT 4

**Total Depth:** 1.9 m

**Ground Surface Elevation:** 685.82 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-4*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Headspace Vapour (ppm) | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***TOPSOIL***<br>Silty Sand with some organics, roots<br>-dry, loose<br>-no hydrocarbon odours | 686<br>0.3 | | | | |
| 1 | | ***PEAT***<br>Black fibrous Peat<br>-dry, soft<br>-no hydrocarbon odours<br>-NATIVE SOIL | 686 | | | | Barrel encountered at 0.5m depth.<br>Minor black staining observed.<br>No hydrocarbon odour detected here nor at any other depth of test-pit. |
| 3 / 1 | | | | | 01TP08-4A-1.0 | 0 | Sample taken from backhoe bucket. |
| 4 | | | 1.3 | | | | |
| | | ***SAND***<br>Grey coarse Sand with small pebbles<br>-dry becoming damp with depth, compact<br>-no hydrocarbon odours<br>-NATIVE SOIL | 685 | | | | |
| 6 | | | 1.9 | | | | Water table not encountered |
| | | End of Test-Pit | 684 | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TESTPIT 5, next to EBA TP8B-1

**Total Depth:** 1.6

**Ground Surface Elevation:** 686.24 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-5*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Headspace Vapour (ppm) | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***FILL*** Assorted debris and garbage mixed with brown sand, silt, organic matter -Considerable staining (due to burning) at bottom of fill layer. -loose, dry | 686 | | 01TP08-5B-0.3F | | Surficial garbage and metal debris noted. Metal debris through out test-pit. 1" dia steel pipe (abandoned fuel line?), assorted garbage<br><br>No hydrocarbon odour detected in this testpit.<br><br>Gyprock and fiberglass encountered at 0.3 m.<br><br>Pieces of coal and broken glass throughout test-pit. |
| 1 / 1 | | | | | 01TP08-5A-1.0 | 0 | Sample taken from bucket. |
| | | | 1.6 | | | | Water table not encountered. |
| | | End of Test-Pit | 685 | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT

**Total Depth:** 2.0 m

**Ground Surface Elevation:** 685.48 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-6*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev(m) | Sample Type | Sample Label | Headspace Vapour (ppm) | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***Miscellaneous Debris*** | 685 | | | | No hydrocarbon odour detected. |
| | | Miscellaneous Debris mixed with dark brown organic sandy silt.<br>-dry, loose | | | | | Considerable debris through out fill.<br>Miscellaneous debris included:<br>- glass fragments, bottles<br>- metal fragments<br>- metal piping<br>- cement blocks |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 / 1 | | | | | | | |
| 4 | | | | | 01TP08-6A-1.2 | 0 | |
| 5 | | | | | | | |
| 6 | | | 2 | | | | Water table not encountered. |
| 2 / 7 | | End of Test-Pit | 683 | | | | |
| 8 | | | | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PWGSC

**Location:** TEST PIT 7

**Total Depth:** 1.3 m

**Ground Surface Elevation:** 686.05 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-7*

**APEC#** 8

**Date:** Sept. 18, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Head Space Vapour Readings | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***TOPSOIL***<br>Brown organic silty sand, with trace roots | 686<br>0.2 | | | | No debris noted in test-pit.<br>No hydrocarbon odour detected in test-pit. |
| 1 | | ***SAND***<br>Coarse Sand.<br>-Occasional seams of pebbles.<br>-Considerable iron staining through out test-pit.<br>-dry, loose | 686 | | 01TP08-7A-1.0 | 10 | Water table not encountered. |
| 2 | | | | | | | |
| 3 / 1 | | | | | | | |
| 4 | | | 1.3 | | | | |
| | | End of Test-Pit | 685 | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PGSC

**Location:** TEST PIT 8

**Total Depth:** 1.8 m

**Ground Surface Elevation:** 685.00 m

**Excavation Method:** Rubber tire backhoe

## *Test-Pit #: 01TP08-8*

**APEC#** 8

**Date:** Sept. 20, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth (ft / m) | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Head Space Vapour Readings | Remarks |
|---|---|---|---|---|---|---|---|
| 0 / 0 | | Ground Surface | 0 | | | | |
| | | ***TOPSOIL***<br>Brown coarse Sand with some silt, organics<br>-dry, loose | 685 | | | | Very large piece of steel (remnant of rock crusher?) encountered in topsoil layer. |
| | | | 0.4 | | | | |
| | | ***SAND***<br>Light brown coarse Sand<br>-dry, loose<br>-no hydrocarbon odour<br>-no staining | 685 | | 01TP08-8-1.0 | 5 | |
| 1 | | | | | | | Water table not encountered |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

**Project No:** 639-0101

**Project:** Ph III CSA Watson Lake Airport

**Client:** PGSC

**Location:** TEST PIT 8

**Total Depth:** 1.8 m

**Ground Surface Elevation:** 685.00 m

**Excavation Method:** Rubber tire backhoe

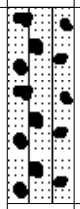
## *Test-Pit #: 01TP08-8*

**APEC#** 8

**Date:** Sept. 20, 2001

**Logged By:** Heidi Pass

**Checked by:** Ahmed Ezzat

| Depth | Symbol | Subsurface Description | Depth/Elev. (m) | Sample Type | Sample Label | Head Space Vapour Readings | Remarks |
|---|---|---|---|---|---|---|---|
| 5 |  | | | | | | |
| | | | 1.8 | | | | |
| 6 | | End of Test-Pit | 683 | | | | |
| 7 | | | | | | | |
| 8 | 2.5 | | | | | | |
| 9 | | | | | | | |

Note: This test-pit log was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Test-pit data require interpretation by Franz Environmental Inc. personnel before use by others.

Franz Environmental
308-1080 Mainland Street
Vancouver, BC V6B 2T4

# APPENDIX C

# YESAB Decision Documents

Yukon
Environment

**Permit No: 4202-25-003**

# PERMIT FOR THE USE OF RISK-BASED RESTORATION STANDARDS AT A CONTAMINATED SITE

Issued pursuant to the *Environment Act* and the *Contaminated Sites Regulation*

| | |
|---|---|
| **Permittee:** | Transport Canada |
| **Mailing Address:** | 344 Edmonton Street, Winnipeg, MB R3C 0P6 |
| **Site Location:** | AECs 3, 4 and 8, Watson Lake Airport, Yukon |
| **Authorized Representative:** | Kelly Hunnie |
| **Phone:** | (204) 880-5128 |
| **Email:** | kelly.hunnie@tc.gc.ca |
| **Effective Date:** | Date of the Director's Signature |
| **Expiry Date:** | December 31, 2023 |

**Scope of Authorization:** In accordance with your application for amendment and supporting documents, Transport Canada, represented by yourself, is hereby authorized to undertake restoration using risk-based standards at the above site location (the "site"), as set out in the terms and conditions of this permit.

Dated this 22nd day of August, 2016

Director, Environmental Programs Branch
Environment Yukon

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 22 Aug 16 Initials: JCM

## 1. DEFINITIONS

1. In this permit,
   a) "Act" means the *Environment Act*, R.S.Y. 2002, c. 76;
   b) "application" means the permit application submitted by the permittee to apply risk-based restoration standards to a contaminated site and that has been accepted by the Branch, and includes the risk assessment, site assessment, and all supporting documents;
   c) "approved plan" means a plan that is submitted by the permittee and approved by an environmental protection analyst under this permit and includes any terms and conditions specified by the environmental protection analyst in the approval;
   d) "associated personnel" means all employees, contractors and volunteers involved in the permitted activities;
   e) "Branch" means the Environmental Programs Branch, Environment Yukon;
   f) "CSR" means the *Contaminated Sites Regulation*, O.I.C. 2002/171;
   g) "environmental protection analyst" means an employee of the Branch so designated by the Minister of Environment under the Act;
   h) "environmental protection officer" means an employee of the Government of Yukon so designated by the Minister of Environment under the Act;
   i) "maximum concentration" means the concentration of contaminants applied in human health and ecological risk assessment calculations;
   j) "monitoring plan" means the report titled "Proposed Annual Groundwater Monitoring for Landfills AEC 3, 4, and 8, Watson Lake Airport, Watson Lake, Yukon", October 29, 2010, Franz Environmental Inc.;
   k) "risk assessment" means a quantitative human health and ecological risk assessment;
   l) "risk management" means actions, including land use restrictions, engineering and administrative controls (including landfill covers), and monitoring, designed to prevent or mitigate impacts to the environment or human health that may be caused by contamination at a contaminated site; and
   m) "supporting documents" means documents, correspondence or other material submitted in conjunction with the application.

2. Any term not defined in this permit that is defined in the Act or the CSR has the same meaning as in the Act or the CSR.



## 2. GENERAL

1. No condition of this permit limits the applicability of any other law or bylaw.

2. The permittee shall ensure that all activities authorized by this permit occur on property that the permittee has the right to enter upon and use for that purpose.

3. The permittee shall ensure that all associated personnel:
   a) have access to a copy of this permit;
   b) are knowledgeable of the terms and conditions of this permit; and
   c) receive the appropriate training for the purposes of carrying out the requirements of this permit.

4. The permittee shall provide notice in writing to an environmental protection analyst prior to any significant change of the use and management of the site including without limitation:
   a) a change in the restoration strategies or risk management being applied to the site, including timetables for the implementation of a restoration strategy;
   b) any change that would disturb the soil, groundwater, or surface water, or any risk management measure or control employed at the site;
   c) a change in the mailing address of the permittee; or
   d) a change in ownership of the site.

5. Where conflicts exist between this permit, the permit application or any plans, this permit shall prevail.

6. For clarity, all obligations of the permittee under this permit survive the expiry date.

7. If an environmental protection analyst or environmental protection officer directs in writing that a submitted plan, including plans submitted under previous permits be amended, the permittee must prepare the required amendment by the date specified.

## 3. SITE CONDITIONS

1. The permittee shall not take any action or allow any action to be taken that would invalidate the risk assessment including disturbing the surface water, groundwater, or soil, changing the land use, or removing or altering risk management measures or controls at the site.

2. All risk management measures and controls, including landfill covers installed at AEC 3, AEC 4, and AEC 8 shall be maintained in accordance with the application.

## 4. MONITORING

1. The permittee shall submit an updated monitoring plan to an environmental protection analyst for approval by January 4, 2017. The updated plan shall identify new, existing and decommissioned groundwater monitoring wells, and shall include a figure which illustrates the location of each well and groundwater flow direction at the site.

2. Groundwater monitoring wells at AEC 3, 4, and 8 shall be sampled a minimum of once per year.

3. All sampling shall be conducted in accordance with all applicable protocols pursuant to the CSR that pertain to sampling and analysis and that are in effect at the time of sample collection. Sample collection must be carried out by trained personnel using appropriate equipment and procedures.

4. If any monitoring results or further site assessment activities demonstrate that:
   a) groundwater contaminant concentrations at the site location are above the maximum concentrations applied in the application for two consecutive sampling events;
   b) groundwater contaminant concentrations not previously evaluated as part of the application are detected at or above applicable CSR standards for two consecutive sampling events; or
   c) any assumption made in the risk assessment is otherwise invalidated,

   the permittee shall notify an environmental protection analyst within 14 days of receipt of analytical results or other information which invalidates the assumptions made under the risk assessment. The permittee shall update the application and provide a copy to an environmental protection analyst for approval within six months of receipt of analytical results or other information which invalidates the assumptions made as part of the risk assessment.

5. If an update to the application is required as described under section 4.4 above, the permittee is required to pay all costs associated with external expert review of the application as described in the *Permit Term, Fee and Technical Review Regulation* and the Branch's factsheet titled "Technical Reviews".

6. The permittee shall conduct an inspection of the site a minimum of two times per year.

7. If an inspection reveals that the site, equipment or risk management measures are in any way not in compliance with this permit, the application or approved plans developed in accordance with this permit, the permittee shall repair the damage or take other actions as required to bring the site, equipment or risk management measures into compliance.

## 5. ANNUAL REPORTING

1. The permitee shall submit to an environmental protection analyst by April 30th of each year, a written report detailing the results of all and any monitoring undertaken in the previous calendar year in accordance with approved risk assessment reports, monitoring plans or plans of restoration for the site location.

2. The annual report shall include, without limitation:

a) a comparison of monitoring data to the maximum concentrations applied in the risk assessment;
b) identification of any exceedances of applicable CSR standards;
c) analysis of long-term groundwater quality trends at the site;
d) the location and construction details of any new groundwater monitoring wells installed at the site during the previous calendar year;
e) details regarding the decommissioning of any groundwater monitoring wells at the site during the previous calendar year;
f) a summary of any maintenance activities conducted in relation to risk management at the site;
g) a summary of any remediation conducted at the site; and
h) a summary of all deficiencies remedied in accordance with section 4.7, including details regarding how and when they were remedied.

## 6. RECORDS

1. The permittee shall keep all records required under this permit in a format acceptable to an environmental protection officer for a minimum of three years and make them available for inspection by an environmental protection officer upon request.

2. The permittee shall keep the following records at the office:
   a) all information required under section 5.2 of this permit;
   b) a copy of each plan developed under this permit, and any amendments to and approvals (if applicable) of each plan;
   c) summaries of all inspections carried out under this permit (including the name of the person conducting the inspection, the date of each inspection, any observations recorded during the inspection, actions taken as a result of those observations, and the date each action was taken); and
   d) notes concerning any spills or leaks occurring at the site, including substance involved, estimated quantity, date of observation of the spill or leak, spill reports made, and clean-up procedures implemented.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 22 Aug 16 Initials: JCM

# APPENDIX D

# Geomembrane Specifications

## 30 Mil High Density Poly Ethylene Geomembrane Liner Specifications

| **Property** | **Unit**<br>**English (Metric)** | **Value**<br>**English (Metric)** |
|---|---|---|
| Thickness | Mil (mm) | 30 (0.75) |
| Density | $g/cm^3$ | 0.94 |
| Tensile Properties<br>Break Strength<br>Break Elongation | <br>lb/in (N/mm)<br>% | <br>114 (20) – 120 (21)<br>700 – 800 |
| Tear Resistance | lb (N) | 16 (71) – 21 (93) |
| Puncture Resistance | lb (N) | 42 (186) – 60 (267) |
| Stress Crack Resistance | hr | 300 – 500 |
| Carbon Black Content | % | 2.0 – 3.0 |
| Oxidative Induction Time (OIT) | Min | 100 |
| High Pressure OIT - % retained after 90 days | % | 60 - 80 |
| High Pressure OIT - % retained after 1600 hr | % | 35 - 50 |